



**LG**

Life's Good

North/Latin America  
Europe/Africa  
Asia/Oceania

Internal Use Only

<http://aic.lgservice.com>  
<http://eic.lgservice.com>  
<http://biz.lgservice.com>

# LED LCD TV

# SERVICE MANUAL

CHASSIS : LA0AA

**MODEL : 22LV255C    22LV255C-UA**

## CAUTION

BEFORE SERVICING THE CHASSIS,  
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

**CONTENTS**

**CONTENTS ..... 2**

**SAFETY PRECAUTIONS ..... 3**

**SPECIFICATION ..... 6**

**ADJUSTMENT INSTRUCTION ..... 10**

**EXPLODED VIEW ..... 16**

**SVC. SHEET .....**

# SAFETY PRECAUTIONS

## IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

### General Guidance

An **isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

### Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

### Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between  $1M\Omega$  and  $5.2M\Omega$ .

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

### Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

### Do not use a line Isolation Transformer during this check.

Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

### Leakage Current Hot Check circuit



# SERVICING PRECAUTIONS

**CAUTION:** Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

**NOTE:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

## General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
  - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
  - b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
  - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

**CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)  
**CAUTION:** This is a flammable mixture.  
Unless specified otherwise in this service manual, lubrication of contacts is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.  
Always remove the test receiver ground lead last.
8. *Use with this receiver only the test fixtures specified in this service manual.*

**CAUTION:** Do not connect the test fixture ground strap to any heat sink in this receiver.

## Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices*. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the

unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.  
**CAUTION:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

## General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
  - a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
  - b. Heat the component lead until the solder melts.
  - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.  
**CAUTION:** Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
  - a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
  - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
  - c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.  
**CAUTION:** Work quickly to avoid overheating the circuit board printed foil.
  - d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

## IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

### Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

### Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

## "Small-Signal" Discrete Transistor

### Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

## Power Output, Transistor Device

### Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

## Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

## Fuse and Conventional Resistor

### Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

**CAUTION:** Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

## Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

### At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

### At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
  2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
  3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
- CAUTION:** Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

# SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

## 1. Application range

This spec sheet is applied LED LCD TV with 22" LA0AA chassis.

## 2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature: 25 °C  $\pm$  5 °C
- 2) Relative Humidity: 65  $\pm$  10 %
- 3) Power Voltage : Standard input voltage(100-240V~, 50/60Hz)  
\* Standard Voltage of each product is marked by models
- 4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
- 5) The receiver must be operated for about 5 minutes prior to the adjustment.

## 3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
  - Safety : UL, CSA, IEC specification
  - EMC: FCC, ICES, IEC specification

## 4. General Specification(TV)

| No | Item                  | Specification   |           | Remark            |
|----|-----------------------|---|-----------|-------------------|
| 1  | Receivable System     | 1) ATSC / NTSC-M  |           |                   |
| 2  | Available Channel     | 1) VHF : 02 ~ 13<br>2) UHF : 14 ~ 69<br>3) DTV : 02 ~ 69<br>4) CATV : 01 ~ 135<br>5) CADTV : 01 ~ 135 |           |                   |
| 3  | Input Voltage         | 1) AC 100 - 240V~ 50/60Hz   |           | Mark : 110V, 60Hz |
| 4  | Market                | North America   |           |                   |
| 5  | Screen Size           | 22 inch Wide (1366x768)   | HD + 60Hz | 22LV255C-UA       |
| 6  | Aspect Ratio          | 16:9  |           |                   |
| 7  | Tuning System         | FS  |           |                   |
| 8  | LCD Module            | M215HW01-VB   | AUO       | 22LV255C-UA       |
| 9  | Operating Environment | Temp : 0 ~ 40 deg<br>Humidity : ~ 80 %  |           |                   |
| 10 | Storage Environment   | Temp : -20 ~ 60 deg<br>Humidity : -85 %   |           |                   |

## 5. Chrominance & Luminance

| No. | Item   |        |   | Min           | Typ         | Max           | Unit              | Remarks   |
|-----|--|--------|---|---------------|-------------|---------------|-------------------|---|
| 1   | Max Luminance<br>(Center 1-point / Full White Pattern) |        |   | 240           | 300         |               | cd/m <sup>2</sup> | 22LV255C-UA   |
| 2   | Luminance uniformity                                   |        |   |               |             |               |                   |   |
| 3   | Color coordinate<br>(Default)                          | RED    | X | Typ.<br>-0.03 | 0.635       | Typ.<br>+0.03 |                   | 22LV255C-UA   |
|     |  |        | Y |               | 0.349       |               |                   |   |
|     |  | GREEN  | X |               | 0.332       |               |                   |   |
|     |  |        | Y |               | 0.619       |               |                   |   |
|     |  | BLUE   | X |               | 0.155       |               |                   |   |
|     |  |        | Y |               | 0.055       |               |                   |   |
|     |  | WHITE  | X |               | 0.313       |               |                   |   |
|     |  |        | Y |               | 0.329       |               |                   |   |
| 4   | Contrast ratio   | Module |   | 700           | 1000        |               |                   | 22LV255C-UA   |
|     |  | DCR    |   | 800,000:1     | 1,000,000:1 |               |                   | AUO   |
| 5   | Color Temperature                                      | Cool   |   | 0.283         | 0.285       | 0.287         | 9300K             | The W/B Tolerance is ±0.015<br>for picture quality by DQA |
|     |  |        |   | 0.291         | 0.293       | 0.295         |                   |   |
|     |  | Medium |   | 0.293         | 0.295       | 0.297         | 8000K             |   |
|     |  |        |   | 0.303         | 0.305       | 0.307         |                   |   |
|     |  | Warm   |   | 0.311         | 0.313       | 0.315         | 6500K             |   |
|     |  |        |   | 0.327         | 0.329       | 0.331         |                   |   |

## 6. Component Video Input (Y, CB/PB, CR/PR)

| No  | Resolution | H-freq(kHz) | V-freq.(kHz) | Pixel clock | Proposed       |
|-----|------------|-------------|--------------|-------------|----------------|
| 1.  | 720*480    | 15.73       | 60           | 13.5135     | SDTV ,DVD 480I |
| 2.  | 720*480    | 15.73       | 59.94        | 13.5        | SDTV ,DVD 480I |
| 3.  | 720*480    | 31.50       | 60           | 27.027      | SDTV 480P      |
| 4.  | 720*480    | 31.47       | 59.94        | 27.0        | SDTV 480P      |
| 5.  | 1280*720   | 45.00       | 60.00        | 74.25       | HDTV 720P      |
| 6.  | 1280*720   | 44.96       | 59.94        | 74.176      | HDTV 720P      |
| 7.  | 1920*1080  | 33.75       | 60.00        | 74.25       | HDTV 1080I     |
| 8.  | 1920*1080  | 33.72       | 59.94        | 74.176      | HDTV 1080I     |
| 9.  | 1920*1080  | 67.500      | 60           | 148.50      | HDTV 1080P     |
| 10. | 1920*1080  | 67.432      | 59.94        | 148.352     | HDTV 1080P     |
| 11. | 1920*1080  | 27.000      | 24.000       | 74.25       | HDTV 1080P     |
| 12. | 1920*1080  | 26.97       | 23.976       | 74.176      | HDTV 1080P     |
| 13. | 1920*1080  | 33.75       | 30.000       | 74.25       | HDTV 1080P     |
| 14. | 1920*1080  | 33.71       | 29.97        | 74.0176     | HDTV 1080P     |

## 7. RGB Input (PC)

| No | Resolution | H-freq(kHz) | V-freq.(kHz) | Pixel clock | Proposed   |     |
|----|------------|-------------|--------------|-------------|------------|-----|
|    | PC         |             |              |             |            | DDC |
| 1. | 640*350    | 31.468      | 70.09        | 25.17       | EGA        | X   |
| 2. | 720*400    | 31.469      | 70.08        | 28.32       | DOS        | O   |
| 3. | 640*480    | 31.469      | 59.94        | 25.17       | VESA(VGA)  | O   |
| 4. | 800*600    | 37.879      | 60.31        | 40.00       | VESA(SVGA) | O   |
| 5. | 1024*768   | 48.363      | 60.00        | 65.00       | VESA(XGA)  | O   |
| 6. | 1280*768   | 47.776      | 59.870       | 79.5        | CVT(WXGA)  | X   |
| 7. | 1360*768   | 47.712      | 60.015       | 85.50       | VESA(WXGA) | X   |



## 8. HDMI input (PC/DTV)

| No | Resolution | H-freq(kHz) | V-freq.(kHz) | Pixel clock | Proposed    |     |
|----|------------|-------------|--------------|-------------|-------------|-----|
|    | PC         |             |              |             |             | DDC |
| 1. | 640*350    | 31.468      | 70.09        | 25.17       | EGA         | X   |
| 2. | 720*400    | 31.469      | 70.08        | 28.32       | DOS         | O   |
| 3. | 640*480    | 31.469      | 59.94        | 25.17       | VESA(VGA)   | X   |
| 4. | 800*600    | 37.879      | 60.31        | 40.00       | VESA(SVGA)  | O   |
| 5. | 1024*768   | 48.363      | 60.00        | 65.00       | VESA(XGA)   | O   |
| 6. | 1280*768   | 47.776      | 59.870       | 79.5        | CVT(WXGA)   | X   |
| 7. | 1360*768   | 47.712      | 60.015       | 85.50       | VESA (WXGA) | O   |
|    |            |             |              |             |             |     |
|    | DTV        |             |              |             |             |     |
| 1  | 720*480    | 31.47       | 60           | 27.027      | SDTV 480P   | O   |
| 2  | 720*480    | 31.47       | 59.94        | 27.00       | SDTV 480P   | O   |
| 3  | 1280*720   | 45.00       | 60.00        | 74.25       | HDTV 720P   | O   |
| 4  | 1280*720   | 44.96       | 59.94        | 74.176      | HDTV 720P   | O   |
| 5  | 1920*1080  | 33.75       | 60.00        | 74.25       | HDTV 1080I  | O   |
| 6  | 1920*1080  | 33.72       | 59.94        | 74.176      | HDTV 1080I  | O   |
| 7  | 1920*1080  | 67.500      | 60           | 148.50      | HDTV 1080P  | O   |
| 8  | 1920*1080  | 67.432      | 59.939       | 148.352     | HDTV 1080P  | O   |
| 9  | 1920*1080  | 27.000      | 24.000       | 74.25       | HDTV 1080P  | O   |
| 10 | 1920*1080  | 26.97       | 23.976       | 74.176      | HDTV 1080P  | O   |
| 11 | 1920*1080  | 33.75       | 30.000       | 74.25       | HDTV 1080P  | O   |
| 12 | 1920*1080  | 33.71       | 29.97        | 74.176      | HDTV 1080P  | O   |

# ADJUSTMENT INSTRUCTION

## 1. Application range

This spec. sheet applies to LA0AA Chassis applied LCD TV all models manufactured in TV factory.

## 2. Specification

- 2.1 Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
- 2.2 Adjustment must be done in the correct order.
- 2.3 The adjustment must be performed in the circumstance of  $25\pm5^{\circ}\text{C}$  of temperature and  $65\pm10\%$  of relative humidity
- 2.4 The input voltage of the receiver must keep 100~240V~, 50/60Hz.
- 2.5 At first Worker must turn on the SET by using Power Only key.
- 2.5 The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15.

In case of keeping module is in the circumstance of  $0^{\circ}\text{C}$ , it should be placed in the circumstance of above  $15^{\circ}\text{C}$  for 2 hours

In case of keeping module is in the circumstance of below  $-20^{\circ}\text{C}$ , it should be placed in the circumstance of above  $15^{\circ}\text{C}$  for 3 hours.

- Caution

When a still image is displayed for 20 minutes or longer (especially where W/B scale is strong. Digital pattern 13ch and/or Cross hatch pattern 09ch), there can some afterimage in the black level area.

## 3. Adjustment items

### 3.1 Board Level Adjustment

- (1) Adjust 480i Comp1(ADC)
- (2) EDID/DDC download

- Remark

- Above adjustment items can be also performed in Final Assembly if needed. Adjustment items in both PCBA and final assembly stages can be checked by using the INSTART Menu 1.ADJUST CHECK.

### 3.2 Final Assembly adjustment

- (1) White Balance adjustment
- (2) RS-232C functionality check
- (3) Factory Option setting per destination
- (4) Shipment mode setting (IN-STOP)

### 3.3 Etc

- (1) Ship-out mode
- (2) Service Option Default
- (3) USB Download(S/W Update, Option, Service only)
- (4) ISP Download (Optional)

## 4. Board Level Adjustment

### 4.1. ADC Adjustment

#### 4.1.1. Overview

- ADC adjustment is needed to find the optimum black level and gain in Analog-to-Digital device and to compensate RGB deviation.

#### 4.1.2. Equipment & Condition

##### 1) Jig (RS-232C protocol)

- Required equipment : Adjustment R/C

\*Enter Service Mode by pushing "ADJ" key,

\*Enter Internal ADC mode by pushing "G" key at "6. ADC Calibration"

#### 4.1.3. Adjustment

##### 4.1.3.1 Adjustment method

- Using RS-232, adjust items listed in 3.1 in the other shown in "4.1.3.3"

##### 4.1.3.2 Adj. protocol

| Protocol           | Command                                      | SetACK  |
|--------------------|--|---|
| Enter adj. mode    | aa 00 00                                     | a 00 OK00x  |
| Source change      | xb 00 40<br>xb 00 60                         | b 00 OK40x (Adjust 480i/1080p Comp1 )<br>b 00 OK60x (Adjust 1920*1080 RGB)  |
| Begin adj.         | ad 00 10                                     |   |
| Return adj. result |  | OKx (Case of Success)<br>NGx (Case of Fail)   |
| Read adj. data     | (main)<br>ad 00 20<br><br>(sub )<br>ad 00 21 | (main)<br>000000000000000000000000000000007c007b006dx<br><br>(Sub)<br>000000007000000000000000000000007c00830077x |
| Confirm adj.       | ad 00 99                                     | NG 03 00x (Fail)<br>NG 03 01x (Fail)<br>NG 03 02x (Fail)<br>OK 03 03x (Success)                                   |
| End adj.           | aa 00 90                                     | a 00 OK90x  |

Ref.) ADC Adj. RS232C Protocol\_Ver1.0

##### 4.1.3.3. Adj. order

- aa 00 00 [Enter ADC adj. mode]
- xb 00 40 [Change input source to Component1(1080i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [Change input source to RGB(1024\*768)]
- ad 00 10 [Adjust 1024\*768 RGB]
- ad 00 90 End adj.

Ref) ADC adj. RS232C Protocol\_Ver1.0

## 4.2. EDID/DDC Download

### 4.2.1 Overview

- It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of "Plug and Play".

### 4.2.2 Equipment

- Since embedded EDID data is used, EDID download JIG, HDMI cable and D-sub cable are not need.
- Adjust remocon.

### 4.2.3 Download method

- Press Adj. key on the Adj. R/C,
- Select EDID D/L menu.
- By pressing Enter key, EDID download will begin
- If Download is successful, OK is display, but If Download is failure, NG is displayed.
- If Download is failure, Re-try downloads.

\* Caution) When EDID Download, must remove RGB/HDMI Cable.

### 4.2.4 EDID DATA

#### 1) North America

# HDMI1-EDID (C/S : 03CC)

EDID Block 0

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 00 FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01
10 | 01 15 01 03 80 10 09 78 0A EE 91 A3 54 4C 99 26
20 | 0F 50 54 A1 08 00 81 80 61 40 45 40 31 40 01 01
30 | 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40 | 45 00 A0 5A 00 00 00 1E 01 1D 00 72 51 D0 1E 20
50 | 6E 28 55 00 A0 5A 00 00 00 1E 00 00 00 FD 00 39
60 | 3F 1F 52 10 00 0A 20 20 20 20 20 20 00 00 FC
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 01 03
```

Block1

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 02 03 1C F1 47 10 22 20 05 84 03 02 23 09 07 07
10 | 67 03 0C 00 10 00 B8 2D E3 05 03 01 02 3A 80 18
20 | 71 38 2D 40 58 2C 04 05 A0 5A 00 00 00 1E 01 1D
30 | 80 18 71 1C 16 20 58 2C 25 00 A0 5A 00 00 00 9E
40 | 01 1D 00 72 51 D0 1E 20 6E 28 55 00 A0 5A 00 00
50 | 00 1E 8C 0A D0 8A 20 E0 2D 10 10 3E 96 00 A0 5A
60 | 00 00 00 18 26 36 80 A0 70 38 1F 40 30 20 25 00
70 | A0 5A 00 00 00 1A 00 00 00 00 00 00 00 00 CC
```

# HDMI2-EDID (C/S : 03BC)

Block0

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 00 FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01
10 | 01 15 01 03 80 10 09 78 0A EE 91 A3 54 4C 99 26
20 | 0F 50 54 A1 08 00 81 80 61 40 45 40 31 40 01 01
30 | 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40 | 45 00 A0 5A 00 00 00 1E 01 1D 00 72 51 D0 1E 20
50 | 6E 28 55 00 A0 5A 00 00 00 1E 00 00 00 FD 00 39
60 | 3F 1F 52 10 00 0A 20 20 20 20 20 20 00 00 FC
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 01 03
```

Block1

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 02 03 1C F1 47 10 22 20 05 84 03 02 23 09 07 07
10 | 67 03 0C 00 20 00 B8 2D E3 05 03 01 02 3A 80 18
20 | 71 38 2D 40 58 2C 04 05 A0 5A 00 00 00 1E 01 1D
30 | 80 18 71 1C 16 20 58 2C 25 00 A0 5A 00 00 00 9E
40 | 01 1D 00 72 51 D0 1E 20 6E 28 55 00 A0 5A 00 00
50 | 00 1E 8C 0A D0 8A 20 E0 2D 10 10 3E 96 00 A0 5A
60 | 00 00 00 18 26 36 80 A0 70 38 1F 40 30 20 25 00
70 | A0 5A 00 00 00 1A 00 00 00 00 00 00 00 00 BC
```

# HDMI3-EDID (C/S : 03AC)

Block0

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 00 FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01
10 | 01 15 01 03 80 10 09 78 0A EE 91 A3 54 4C 99 26
20 | 0F 50 54 A1 08 00 81 80 61 40 45 40 31 40 01 01
30 | 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40 | 45 00 A0 5A 00 00 00 1E 01 1D 00 72 51 D0 1E 20
50 | 6E 28 55 00 A0 5A 00 00 00 1E 00 00 00 FD 00 39
60 | 3F 1F 52 10 00 0A 20 20 20 20 20 20 00 00 FC
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 01 03
```

Block1

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 02 03 1C F1 47 10 22 20 05 84 03 02 23 09 07 07
10 | 67 03 0C 00 30 00 B8 2D E3 05 03 01 02 3A 80 18
20 | 71 38 2D 40 58 2C 04 05 A0 5A 00 00 00 1E 01 1D
30 | 80 18 71 1C 16 20 58 2C 25 00 A0 5A 00 00 00 9E
40 | 01 1D 00 72 51 D0 1E 20 6E 28 55 00 A0 5A 00 00
50 | 00 1E 8C 0A D0 8A 20 E0 2D 10 10 3E 96 00 A0 5A
60 | 00 00 00 18 26 36 80 A0 70 38 1F 40 30 20 25 00
70 | A0 5A 00 00 00 1A 00 00 00 00 00 00 00 00 AC
```

# RGB-EDID (C/S : 1C)

Block0

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 00 FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01
10 | 01 15 01 03 68 10 09 78 0A EE 91 A3 54 4C 99 26
20 | 0F 50 54 A1 08 00 81 80 61 40 45 40 31 40 01 01
30 | 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40 | 45 00 A0 5A 00 00 00 1E 01 1D 00 72 51 D0 1E 20
50 | 6E 28 55 00 A0 5A 00 00 00 1E 00 00 00 FD 00 3A
60 | 3E 1E 53 10 00 0A 20 20 20 20 20 20 00 00 FC
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 00 1C
```

## 5. Final Assembly Adjustment

### 5.1. White Balance Adjustment

#### 5.1.1. Overview

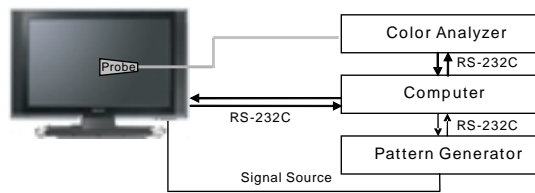
##### 5.1.1.1. W/B adj. Objective & How-it-works

- (1) Objective: To reduce each Panel's W/B deviation
- (2) How-it-works: When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
- (3) Adj. condition: normal temperature
  - 1) Surrounding Temperature: 25±5°C
  - 2) Warm-up time: About 5 Min
  - 3) Surrounding Humidity: 20% ~ 80%

#### 5.1.2. Equipment

- (1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14)
  - (2) Adj. Computer (During auto adj., RS-232C protocol is needed)
  - (3) Adjust Remocon
  - (4) Video Signal Generator MSPG-925F 720p/204-Gray (Model: 217, Pattern: 49)
- Color Analyzer Matrix should be calibrated using CS-1000

#### 5.1.3. Equipment connection



Connection Diagram of Automatic Adjustment

#### 5.1.4. Adjustment Command (Protocol)

##### (1) RS-232C Command used during auto-adj.

| RS-232C COMMAND |    |       | Explanation   |
|-----------------|----|-------|---|
| [CMD]           | ID | DATA] |   |
| Wb              | 00 | 00    | Begin White Balance adj.                              |
| Wb              | 00 | ff    | End White Balance adj. (internal pattern disappears ) |

Ex) wb 00 00 -> Begin white balance auto-adj.  
 wb 00 10 -> Gain adj.  
 ja 00 ff -> Adj. data  
 jb 00 c0

...

...

wb 00 1f -> Gain adj. complete

\*(wb 00 20(start), wb 00 2f(end)) -> Off-set adj.

wb 00 ff ->End white balance auto adj.

#### (2) Adj. Map

Applied Model :

32/37/42/47LK450-UB, 32/42/47LK450-NA, 32/42/47LK451-NB, 32/42/47LK452-NC, 32LK330-UB, 32/42LK430-UA, 42/47/55LK520-UA, 32LK330-NB, 42LK430-NA, 42/47/55LK530-NA

| Adj.   | item   | Command (lower case ASCII) |      | Data Range (Hex.) |     | Default (Decimal) |
|--------|--------|----------------------------|------|-------------------|-----|-------------------|
|        |        | CMD1                       | CMD2 | MIN               | MAX |                   |
| Cool   | R Gain | j                          | g    | 00                | C0  | 172               |
|        | G Gain | j                          | h    | 00                | C0  | 172               |
|        | B Gain | j                          | i    | 00                | C0  | 192               |
|        | R Cut  |                            |      |                   |     | 64                |
|        | G Cut  |                            |      |                   |     | 64                |
|        | B Cut  |                            |      |                   |     | 64                |
| Medium | R Gain | j                          | a    | 00                | C0  | 192               |
|        | G Gain | j                          | b    | 00                | C0  | 192               |
|        | B Gain | j                          | c    | 00                | C0  | 192               |
|        | R Cut  |                            |      |                   |     | 64                |
|        | G Cut  |                            |      |                   |     | 64                |
|        | B Cut  |                            |      |                   |     | 64                |
| Warm   | R Gain | j                          | d    | 00                | C0  | 192               |
|        | G Gain | j                          | e    | 00                | C0  | 192               |
|        | B Gain | j                          | f    | 00                | C0  | 172               |
|        | R Cut  |                            |      |                   |     | 64                |
|        | G Cut  |                            |      |                   |     | 64                |
|        | B Cut  |                            |      |                   |     | 64                |

#### 5.1.5. Adjustment method

##### 5.1.5.1 Auto WB calibration

- 1) Set TV in adj. mode using POWER ONLY (P-ONLY) key
- 2) Zero calibrate probe then place it on the center of the Display
- 3) Connect Cable(RS-232C)
- 4) Select mode in adj. Program and begin adj.
- 5) When adj. is complete (OK Sing), check adj. status pre mode (Cool, Medium, Warm)
- 6) Remove probe and RS-232C cable to complete adj.

- W/B Adj. must begin as start command "wb 00 00" , and finish as end command "wb 00 ff", and Adj. offset if need

##### 5.1.5.2 Manual adj. method

- 1) Set TV in Adj. mode using POWER ON
- 2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface..
- 3) Press ADJ key -> EZ adjust using adj. R/C 6. White-Balance then press the cursor to the right (KEYG). (When KEY(G) is pressed 204 Gray(80IRE) internal pattern will be displayed)
- 4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
- 5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

- If internal pattern is not available, use RF input. In EZ Adj. menu 6.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 204 Gray pattern.

- Adj. condition and cautionary items

1) Lighting condition in surrounding area

Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.

2) Probe location : Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~100°)

3) Aging time

- After Aging Start, Keep the Power ON status during 5 Minutes.
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

5.1.6 Reference (White Balance Adj. coordinate and color temperature)

(1) Luminance: 204 Gray, 80IRE

(2) Standard color coordinate and temperature using CS-1000 (over 26 inch)

| Mode   | Color Coordination |       | Temp   | $\Delta UV$ |
|--------|--------------------|-------|--------|-------------|
|        | x                  | y     |        |             |
| COOL   | 0.269              | 0.273 | 13000K | 0.0000      |
| MEDIUM | 0.285              | 0.293 | 9300K  | 0.0000      |
| WARM   | 0.313              | 0.329 | 6500K  | 0.0000      |

- Standard color coordinate and temperature using CA-210(CH 9)

| Mode   | Color Coordination |             | Temp   | $\Delta UV$ |
|--------|--------------------|-------------|--------|-------------|
|        | x                  | y           |        |             |
| COOL   | 0.269±0.002        | 0.273±0.002 | 13000K | 0.0000      |
| MEDIUM | 0.285±0.002        | 0.293±0.002 | 9300K  | 0.0000      |
| WARM   | 0.313±0.002        | 0.329±0.002 | 6500K  | 0.0000      |

## 5.2 HDCP (High-Bandwidth Digital Contents Protection) SETTING

### 5.3 Option selection per country

#### 5.3.1 Overview

- Option selection is only done for models in Non-USA North America due to rating
- Applied model: LA01U Chassis applied None USA model(CANADA, MEXICO)

#### 5.3.2 Method

- (1) Press ADJ key on the Adj. R/C, and then select Country Group Menu
- (2) Depending on destination, select KR or US, then on the lower Country option, select US, CA, MX. Selection is done using +, - KEY

### 5.4 Tool Option selection

- Method: Press Adj. key on the Adj. R/C, then select Tool option.

| Model      | Tool1 | Tool2 | Tool3 | Tool4 | Tool5 | Menu |
|------------|-------|-------|-------|-------|-------|------|
| 26LK330-UB | 13896 | 18966 | 51209 | 2328  | 290   | AUO  |

### 5.5 Ship-out mode check (In-stop)

- After final inspection, press In-Stop key of the Adj. R/C and check that the unit goes to Stand-by mode.

## 6. GND and Hi-pot Test

### 6.1. Method

#### 6.1.1. GND & HI-POT auto-check preparation

- (1) Check the POWER CABLE and SIGNAL CABLE insertion condition

#### 6.1.2. GND & HI-POT auto-check

- (1) Pallet moves in the station. (POWER CORD / AV CORD is tightly inserted)
- (2) Connect the AV JACK Tester.
- (3) Controller (GWS103-4) on.
- (4) GND Test (Auto)
  - If Test is failed, Buzzer operates.
  - If Test is passed, execute next process (Hi-pot test). (Remove A/V CORD from A/V JACK BOX)
- (5) HI-POT test (Auto)
  - If Test is failed, Buzzer operates.
  - If Test is passed, GOOD Lamp on and move to next process automatically.

### 6.2. Checkpoint

- TEST voltage
  - GND: 1.5KV/min at 100mA
  - SIGNAL: 3KV/min at 100mA
- TEST time: 1 second
- TEST POINT
  - GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
  - Internal Pressure TEST = POWER CORD GND & LIVE & NEUTRAL
- LEAKAGE CURRENT: At 0.5mA

## 7. EYE-Q Check

Step 1) Turn on the TV.

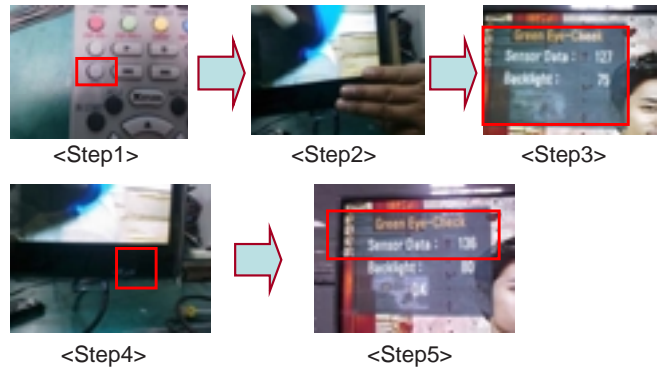
Step 2) Press EYE button in adjust remote control.

Step 3) Stay 6 seconds with Eye Q sensor hidden located on the front of the set.

Step 4) Check the "Sensor Data" on the screen and check whether the value is lower than after 6 seconds, the value does not go below 10, Eye Q sensor is not working properly. Then, change the sensor.

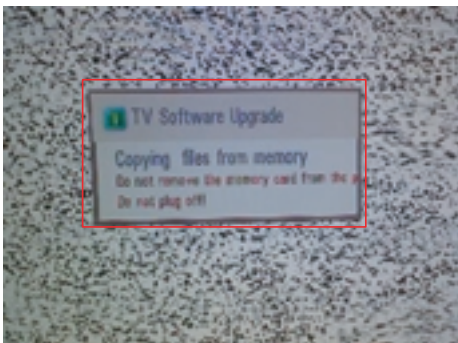
Step 5) Remove hand from the Eye Q II sensor and stay for 6 seconds.

Step 6) Check whether the "Back Light (xxx)" value has risen on the screen. If after 6 seconds and the value still does not go high, the eye Q II sensor is not working properly. Replace the sensor.

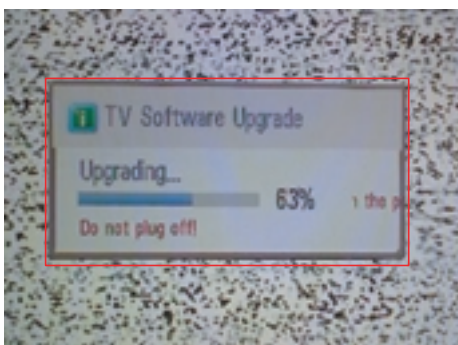


## 8. USB S/W Download (Option, Service only)

1. Put the USB Stick to the USB socket
2. Automatically detecting update file in USB Stick
  - If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting
3. Show the message "Copying files from memory"



4. Updating is starting.



5. Updating Completed, The TV will restart automatically
6. If your TV is turned on, check your updated version and Tool option. (Explain the Tool option, next stage)

\* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

**\* After downloading, have to adjust TOOL OPTION again.**

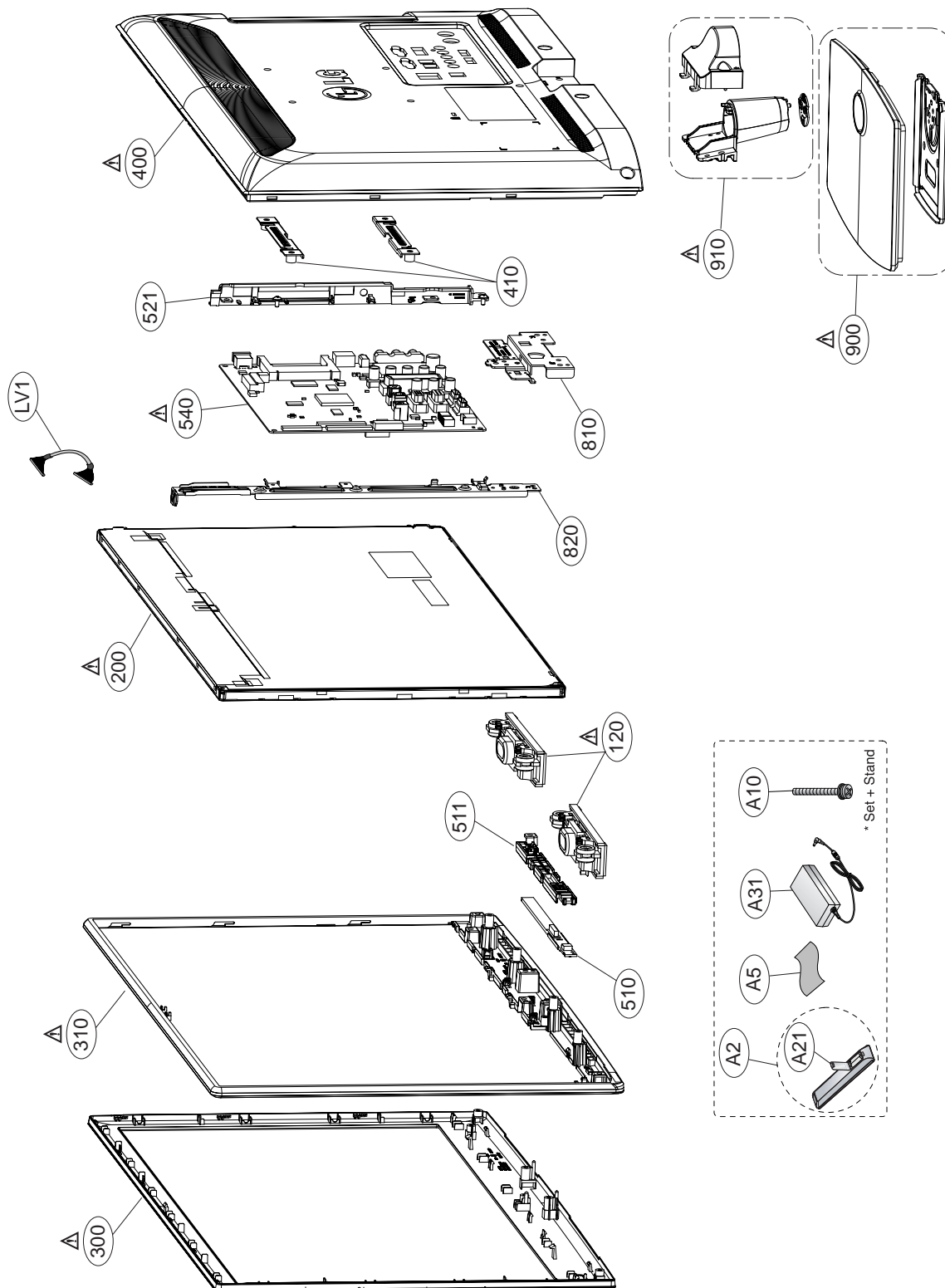
1. Push "IN-START" key in service remote controller.
2. Select "Tool Option 1" and Push "OK" button.
3. Punch in the number. (Each model has their number.)



# EXPLODED VIEW

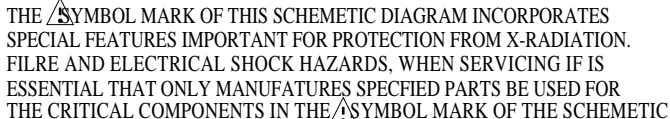
## IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  $\Delta$  in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.









LG Electronics

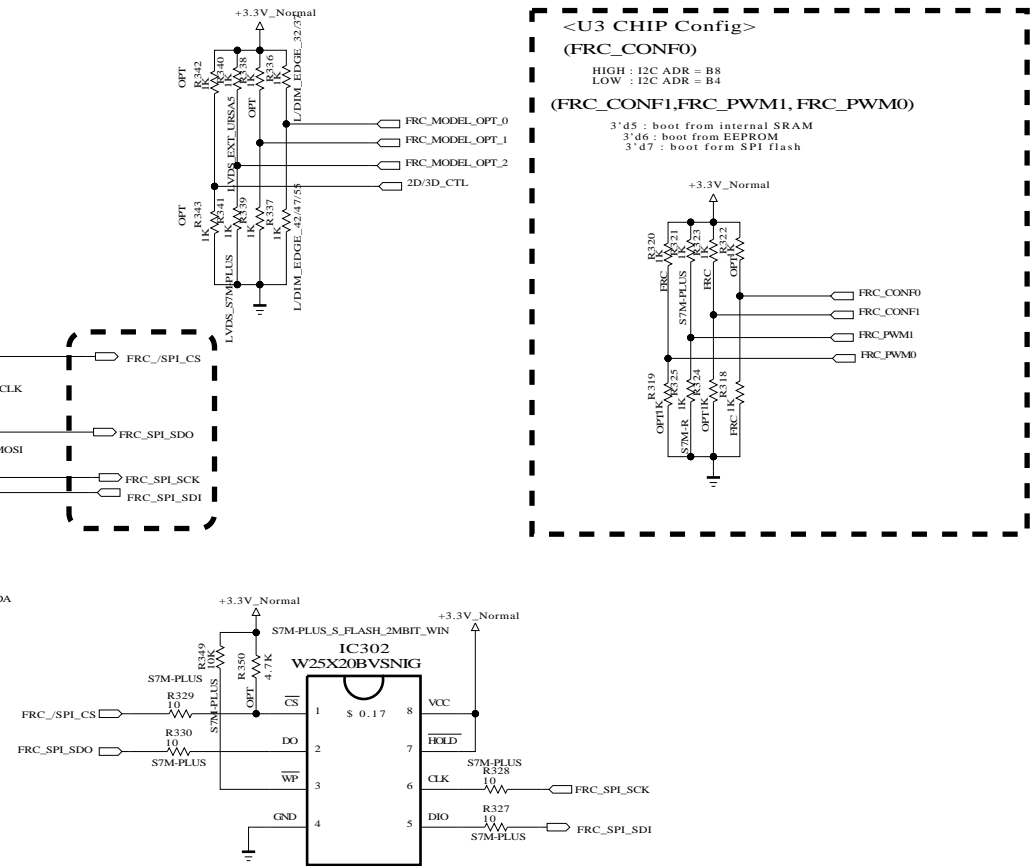
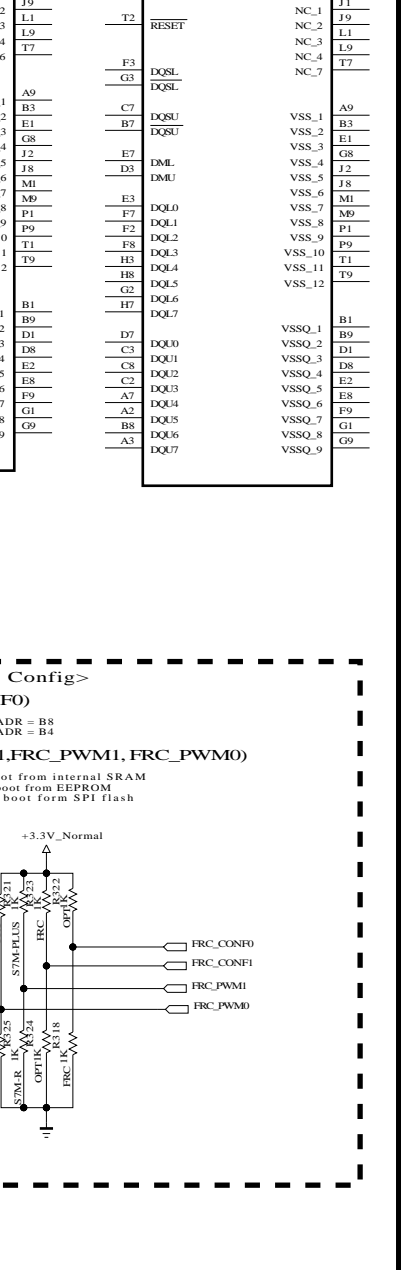
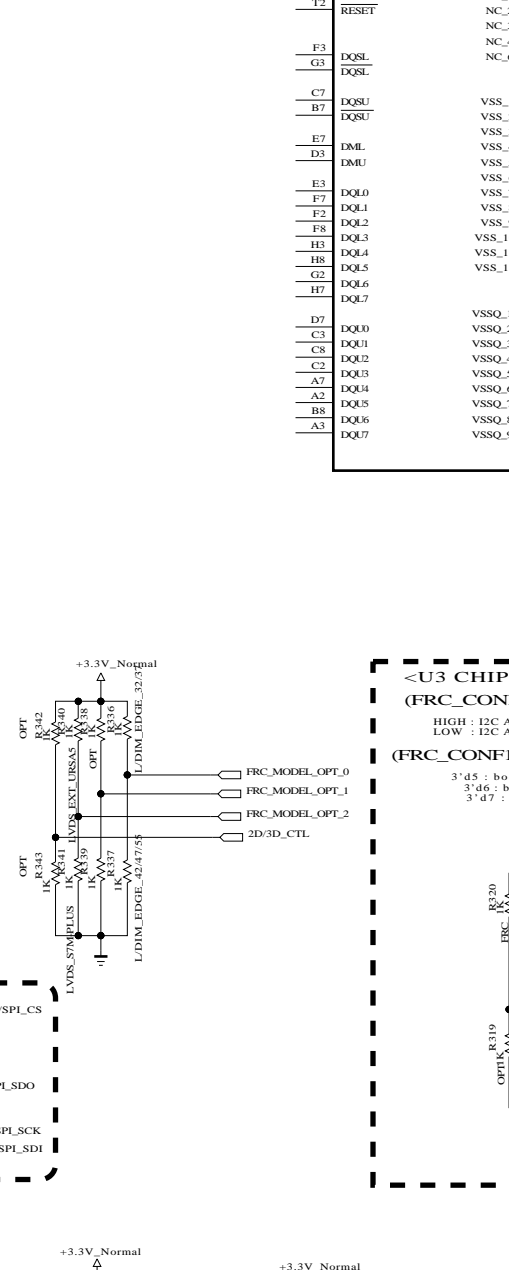
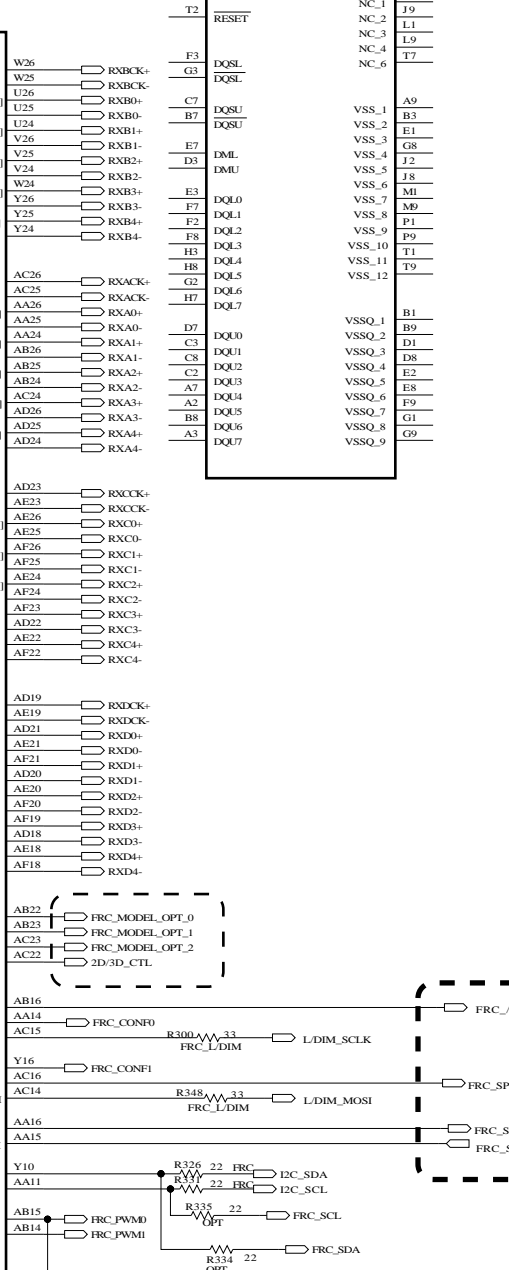
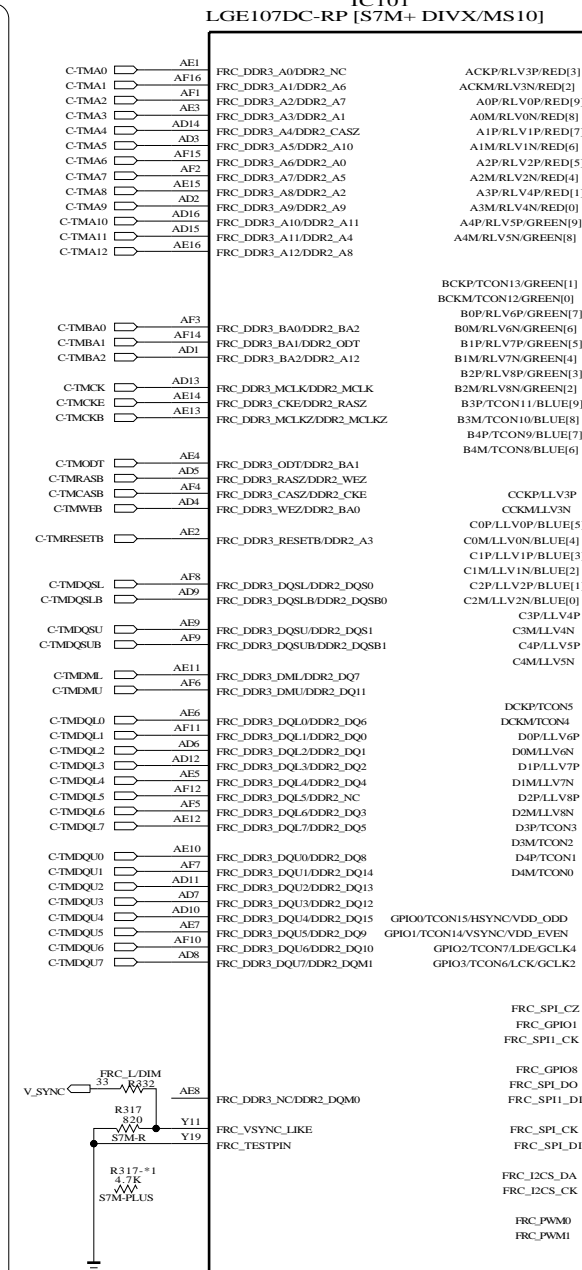
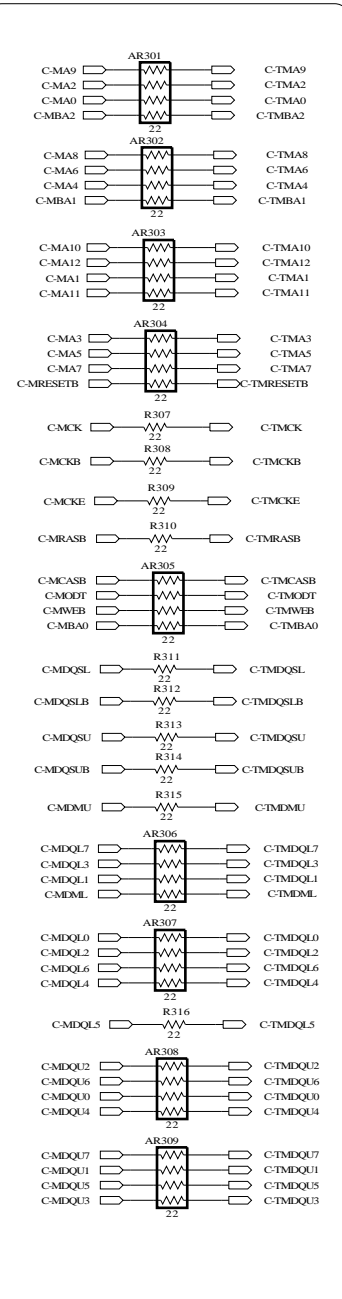
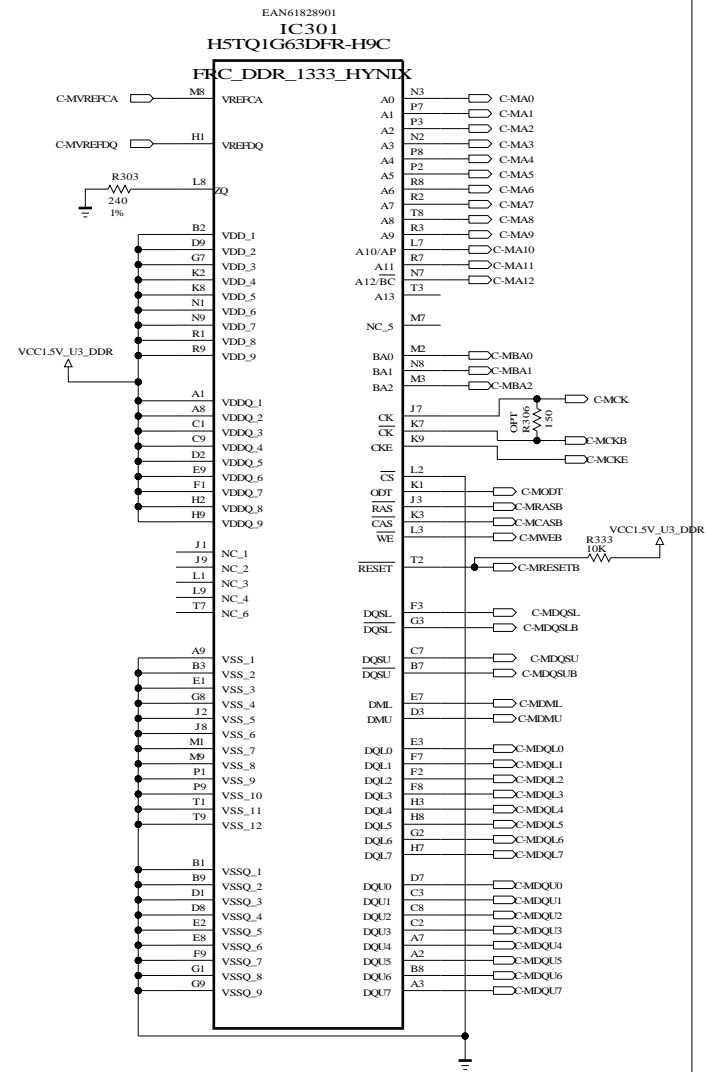
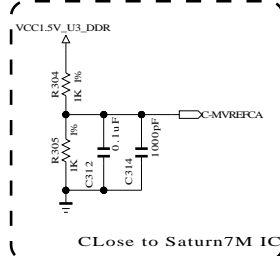
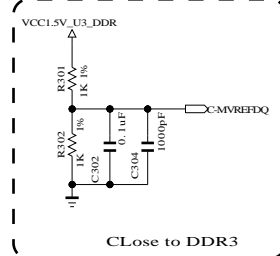
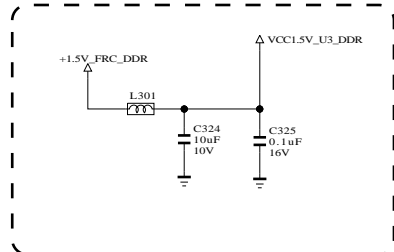
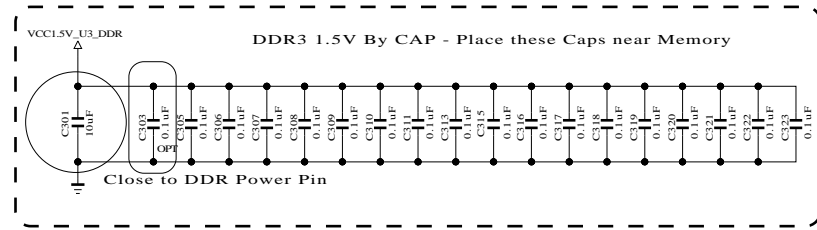


# BLOCK

MAIN2, HW OPT

# SHEE

2

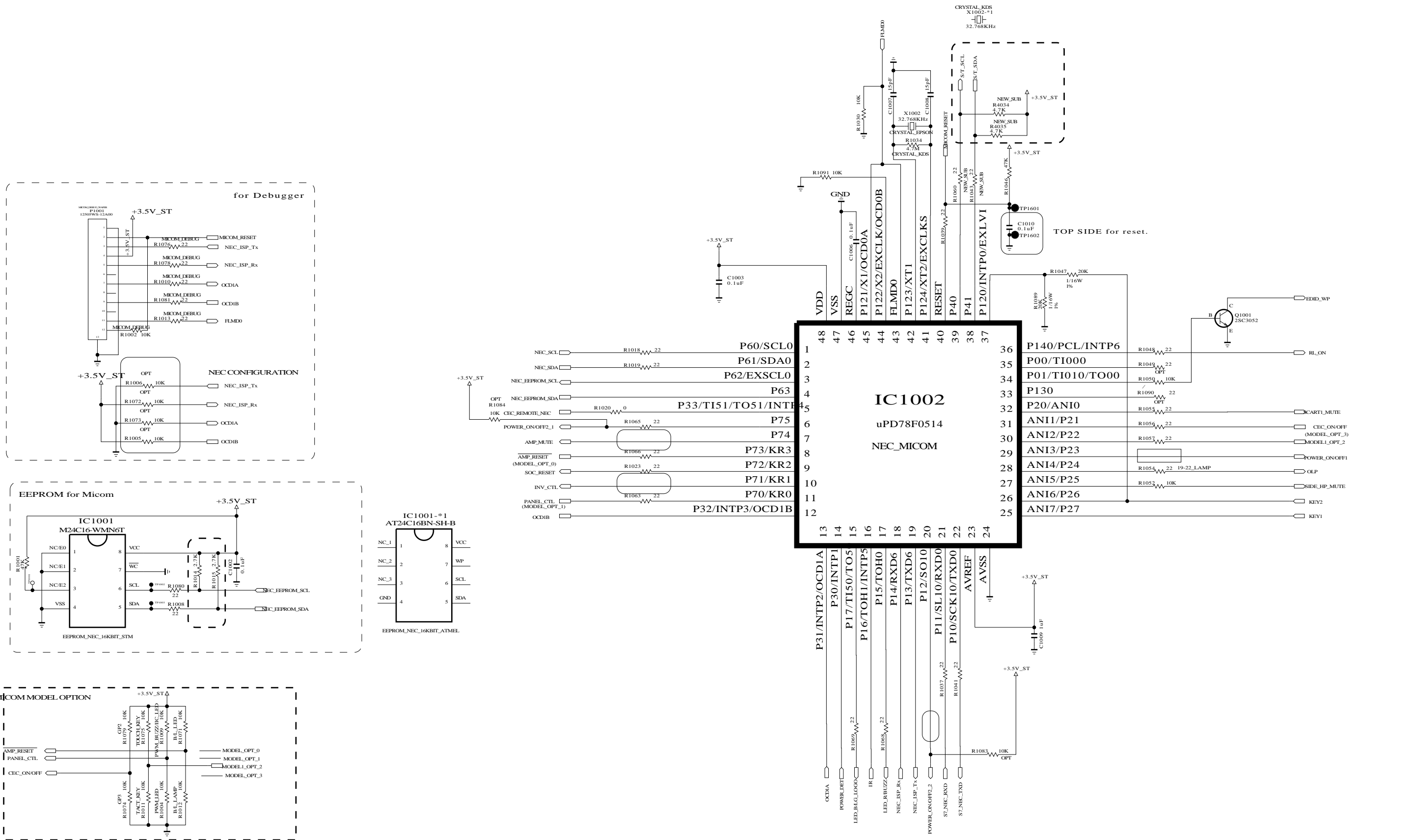


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics

LG ELECTRONICS

|             |                 |            |               |
|-------------|-----------------|------------|---------------|
| MODEL BLOCK | GP2R<br>FRC_DDR | DATE SHEET | 20101023<br>3 |
|-------------|-----------------|------------|---------------|



THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

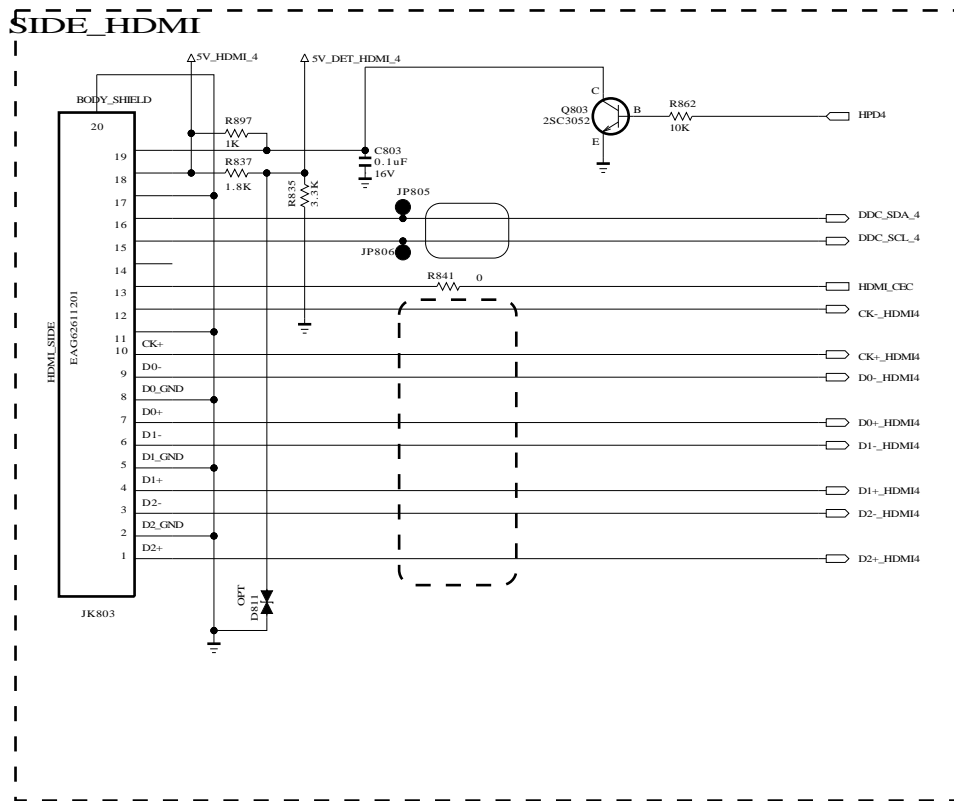
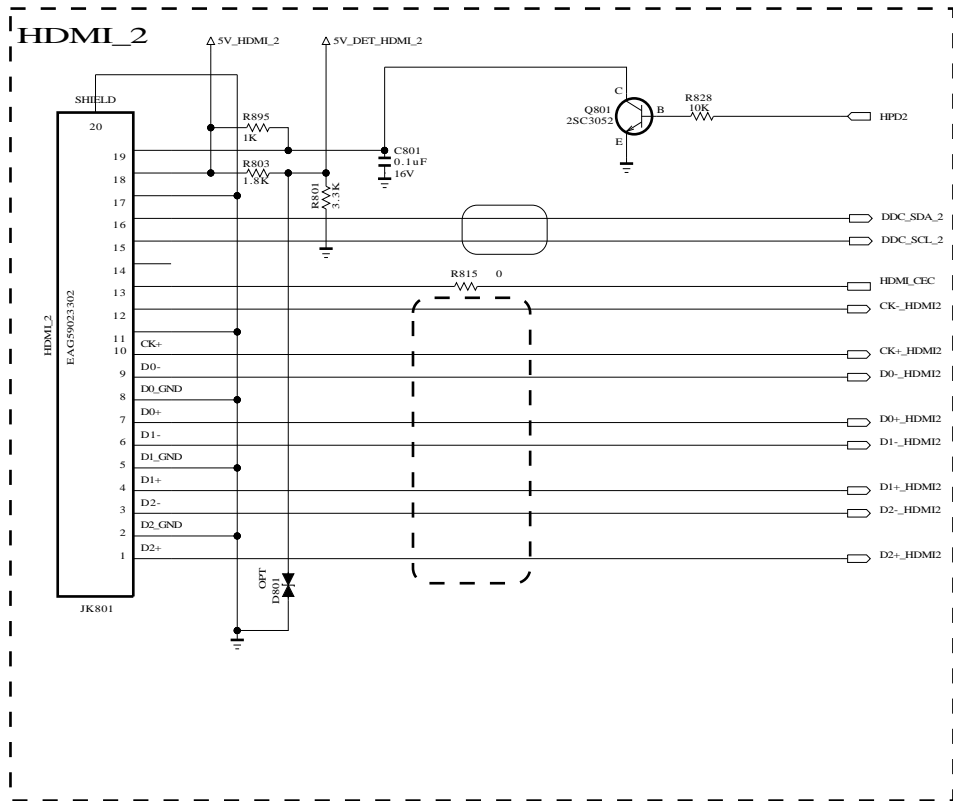
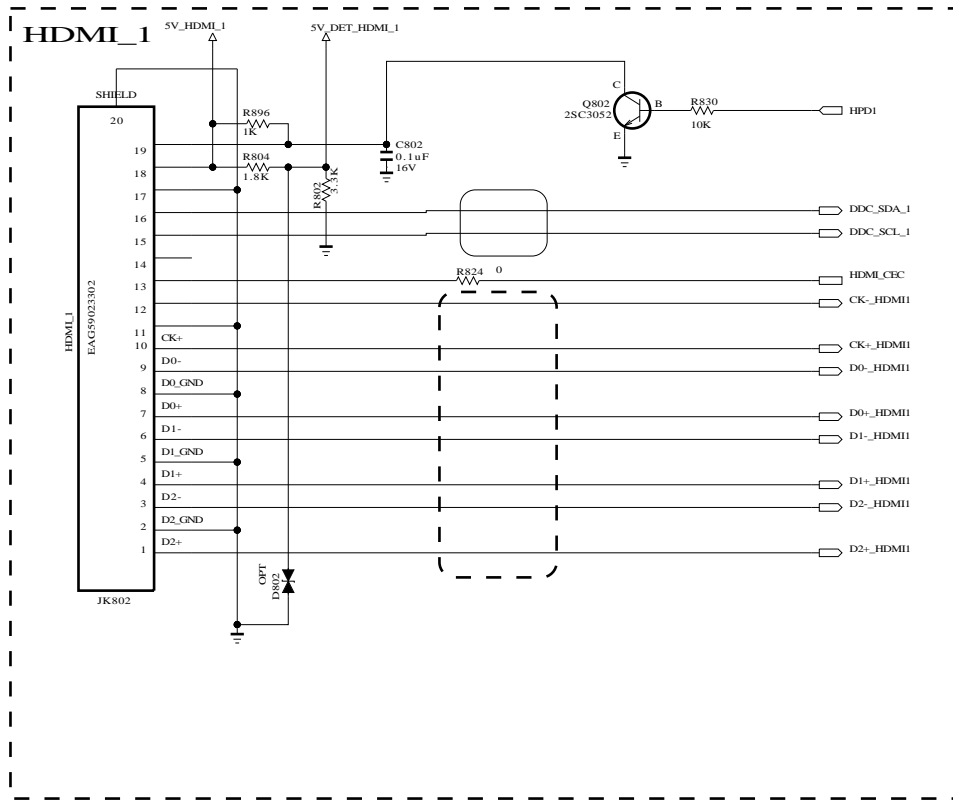
SECRET  
LGElectronics

LG ELECTRONICS

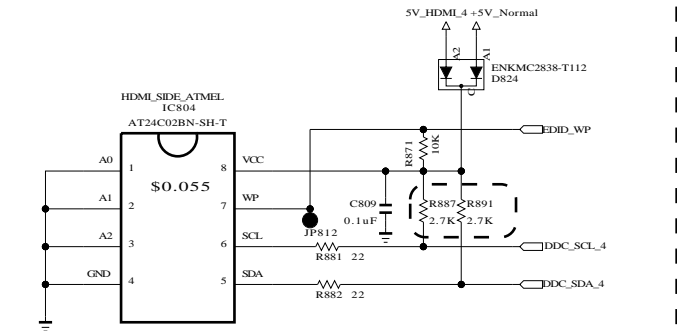
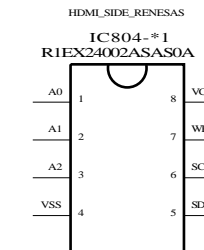
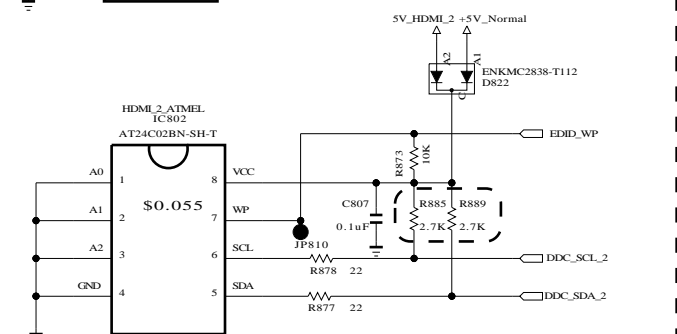
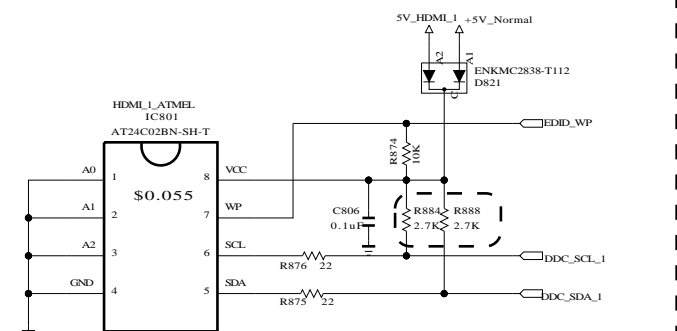
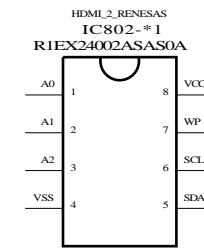
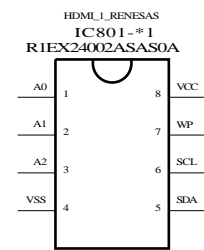
|       |             |       |          |
|-------|-------------|-------|----------|
| MODEL | GP2R        | DATE  | 20101125 |
| BLOCK | MICOM Rev.4 | SHEET | 5 /      |

# USB\_DIODES

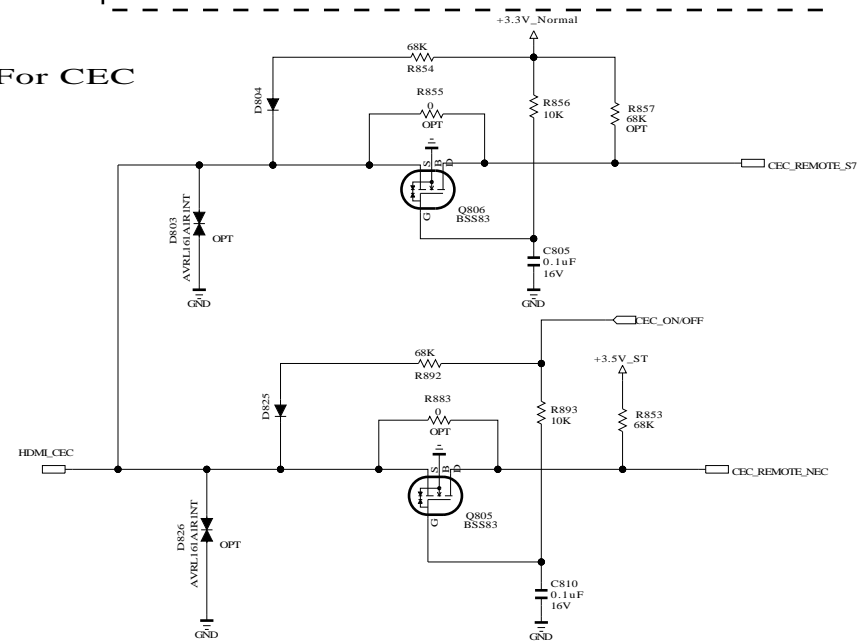
The schematic diagram illustrates a USB diode circuit. At the top, a USB connector is shown with pins 1 through 5. Pin 1 is connected to GND. Pin 2 is connected to the +5V\_USB line. Pin 3 is connected to the +3.3V\_Normal line. Pin 4 is connected to the USB1\_OCD line. Pin 5 is connected to the USB1\_CTL line. The circuit includes a 3.3V USB Normal regulator, a 4.7K OPT resistor, and a 47K resistor. The IC1450 (AP2191DSG) is a dual in-line package with pins labeled NC, OUT\_2, OUT\_1, FLG, GND, IN\_1, IN\_2, and EN. The circuit is designed to interface a USB device with a 3.3V USB Normal regulator.



## HDMI EEPROM

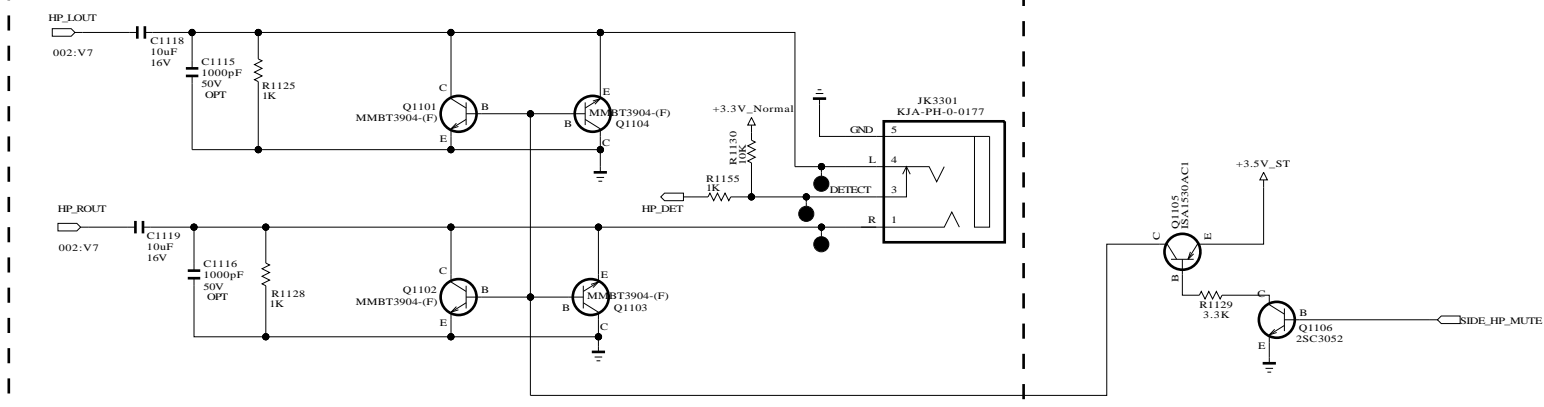


## For CEC

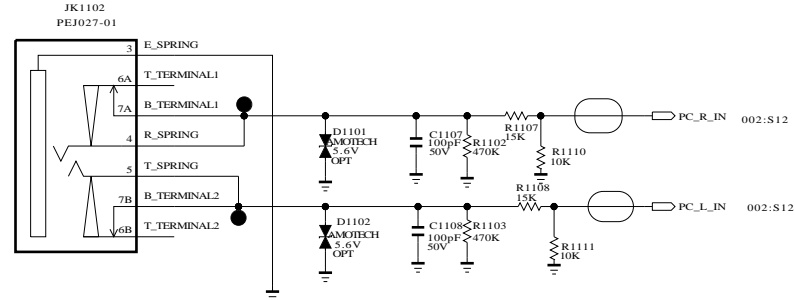


# RGB/SPDIF/PC/HP

## New Item Development

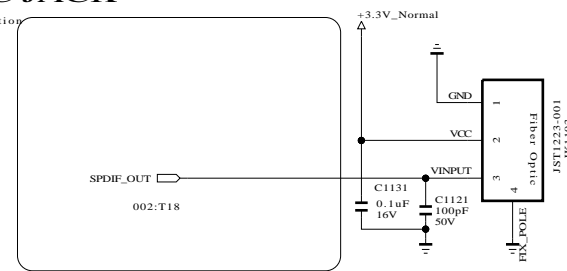


## PC AUDIO

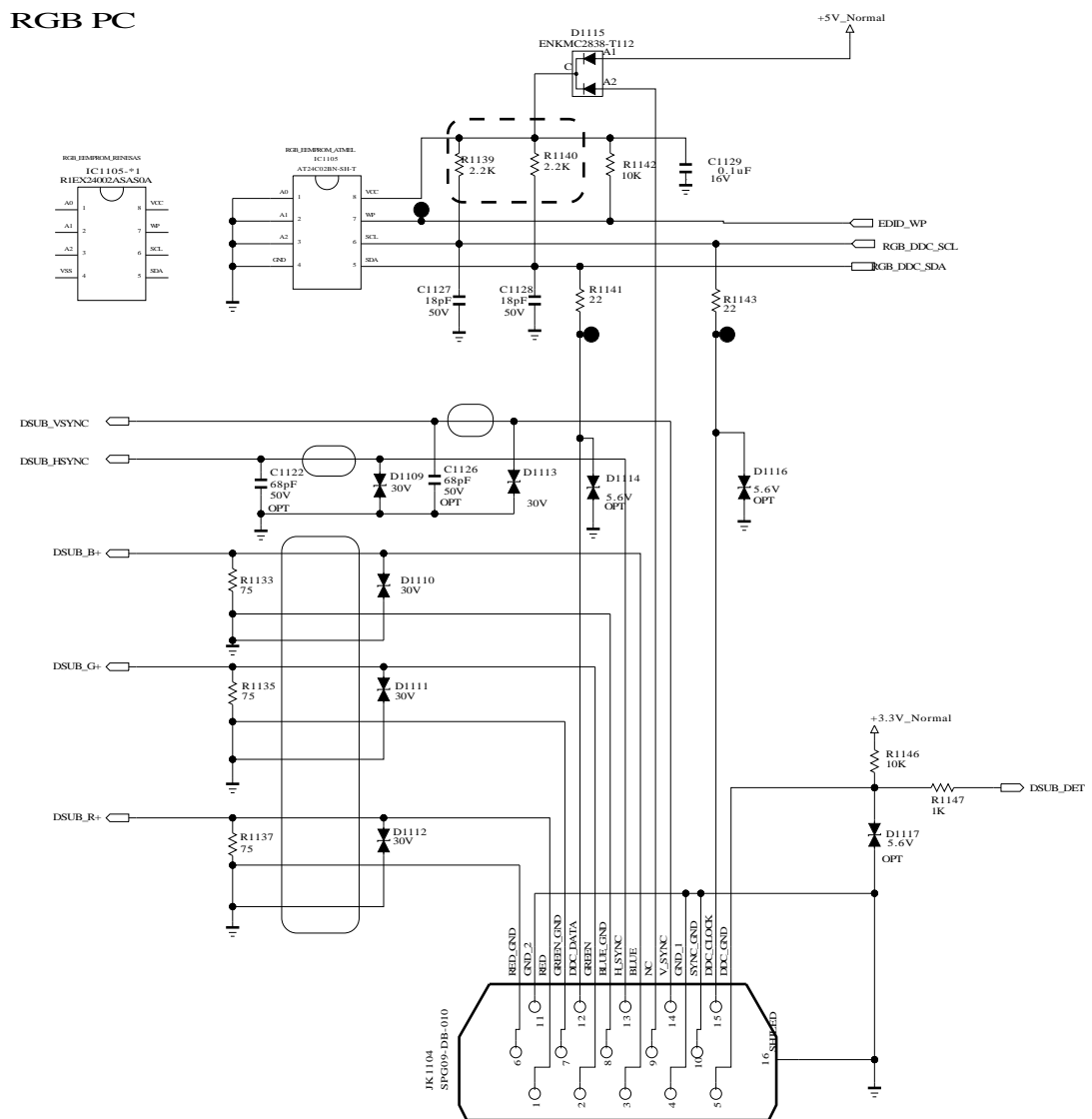




## SPDIF OPTIC JACK

### 5.15 Mstar Circuit Application



## RGB PC



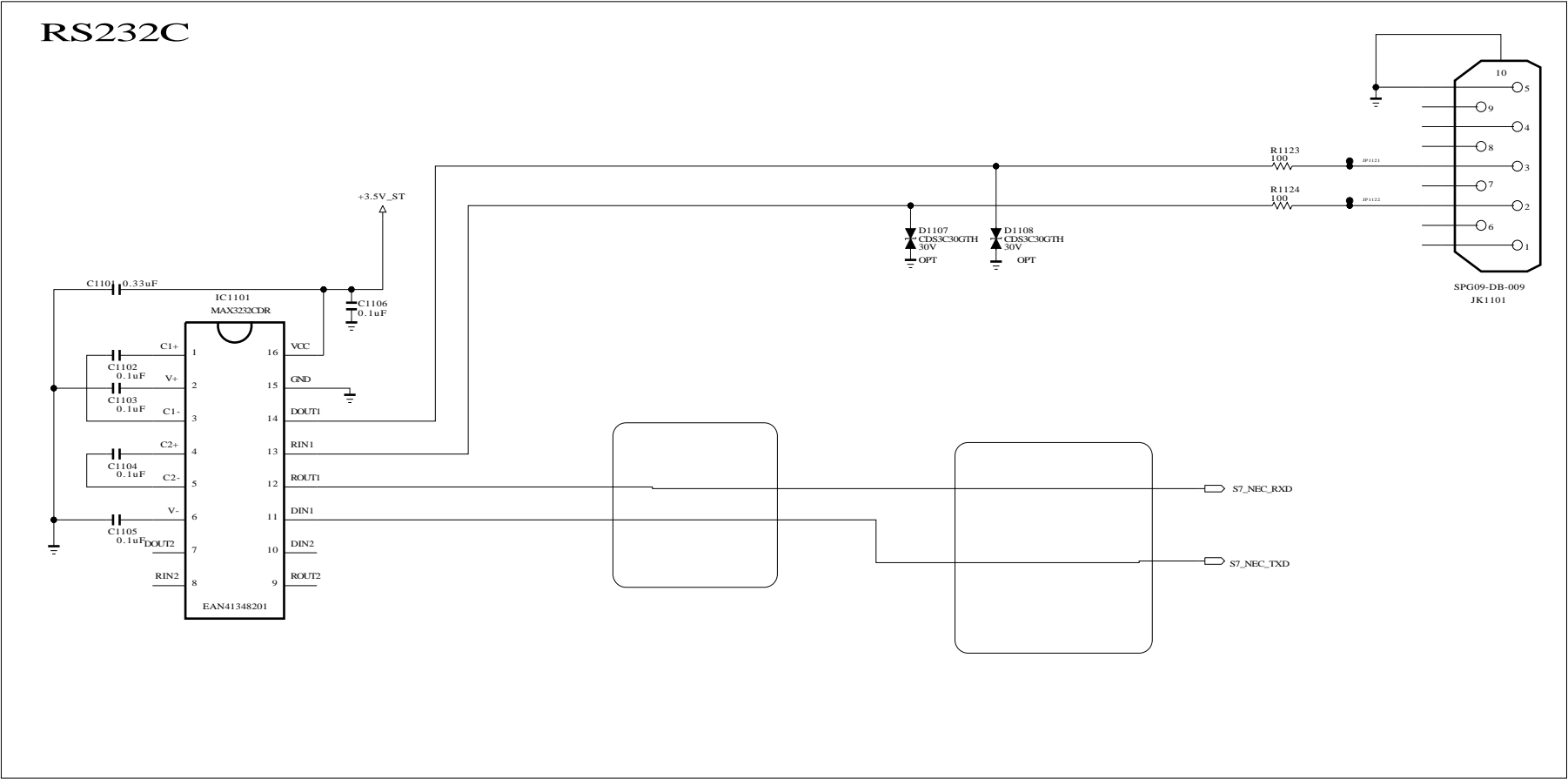
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET  
LGElectronics



|       |              |       |          |
|-------|--------------|-------|----------|
| MODEL | GP2R         | DATE  | 20101023 |
| BLOCK | RGB/SPDIF/HP | SHEET | 9 /      |

# RS232C



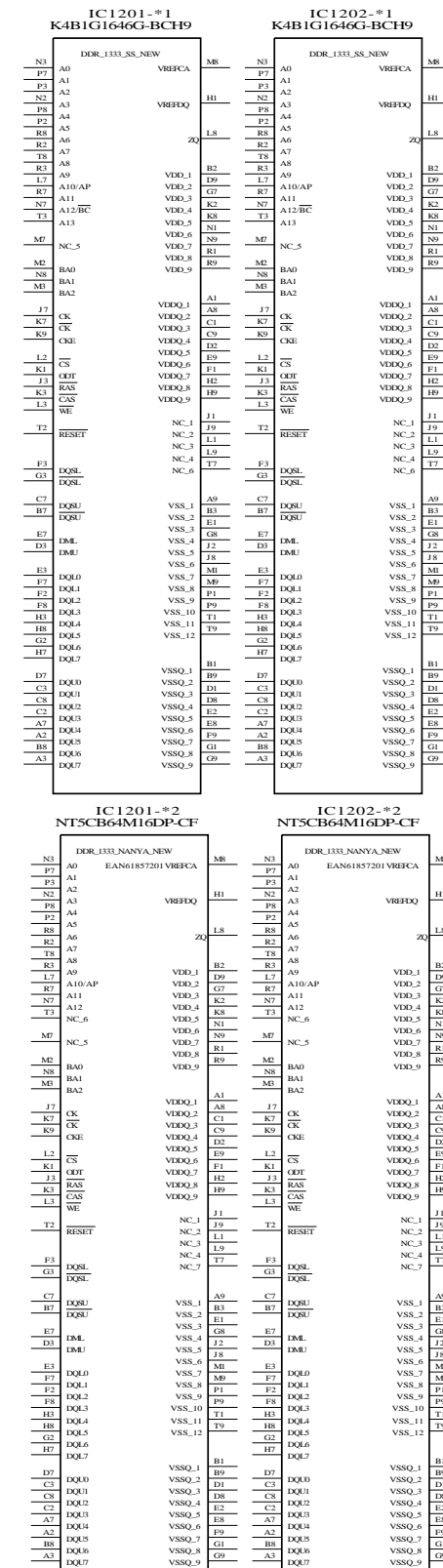
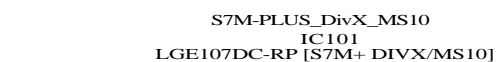
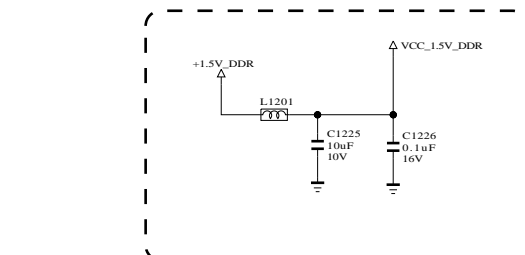
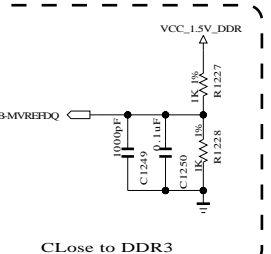
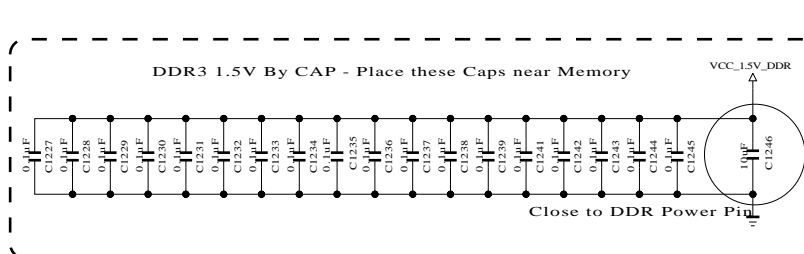
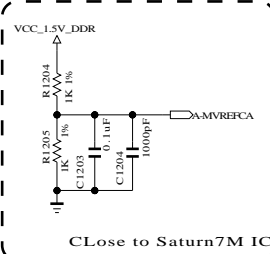
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

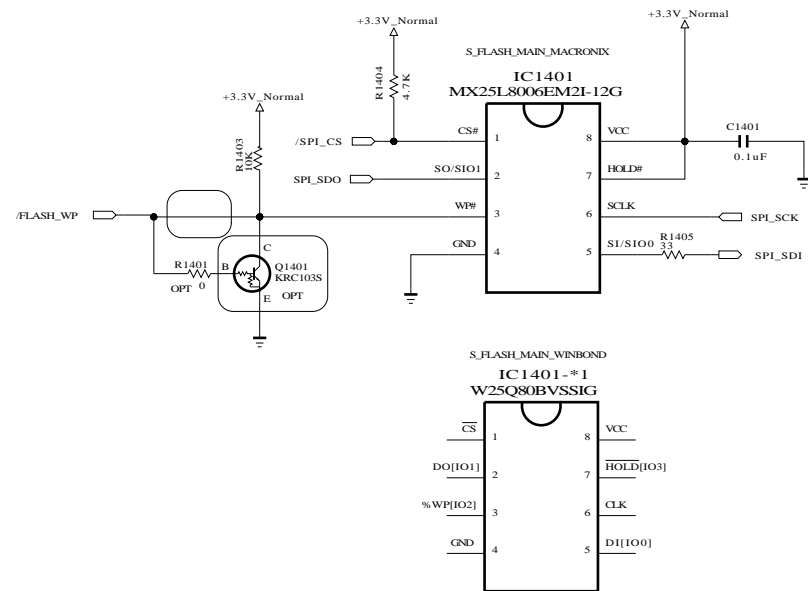
SECRET  
LGElectronics



|       |             |       |          |
|-------|-------------|-------|----------|
| MODEL | GP2R        | DATE  | 20101023 |
| BLOCK | RS232C_9PIN | SHEET | 10 /     |







THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

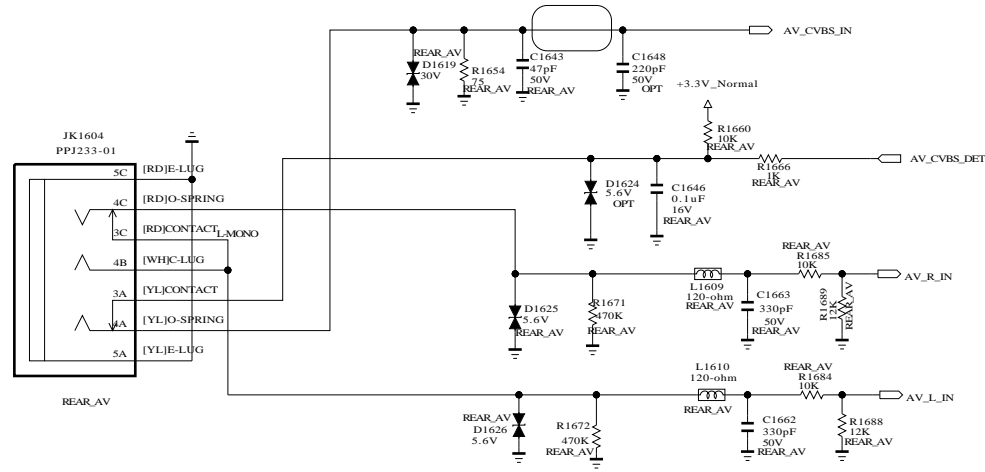
SECRET  
LGElectronics



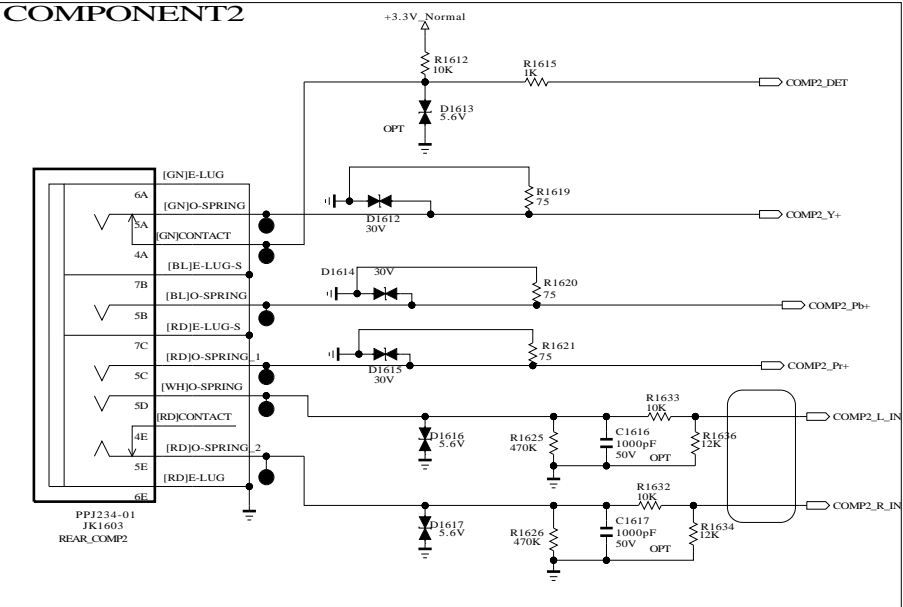
|        |           |       |          |
|--------|-----------|-------|----------|
| MODEL  | GP2R      | DATE  | 20101023 |
| BLOCKS | FLASH 1MB | SHEET | 13 /     |



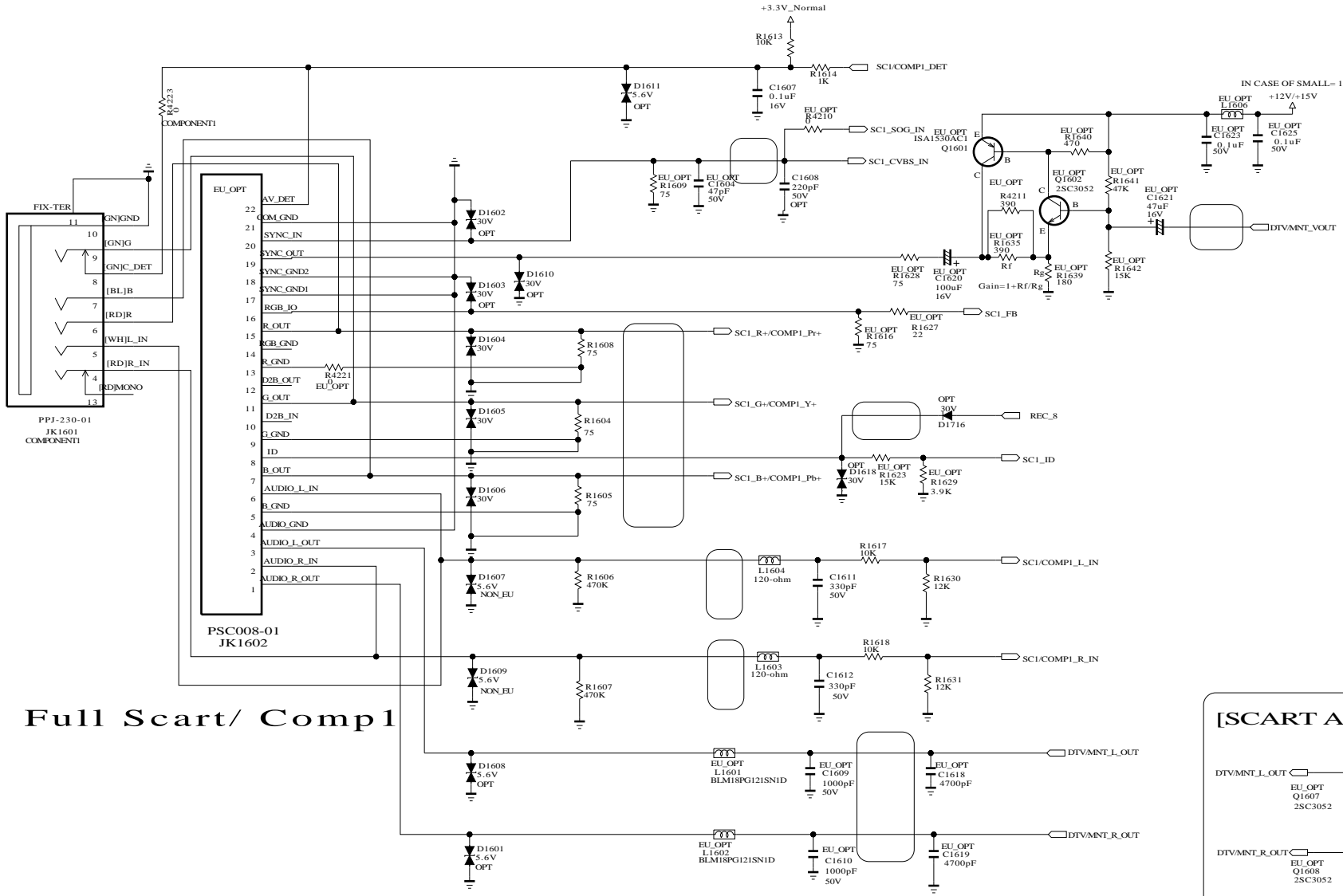
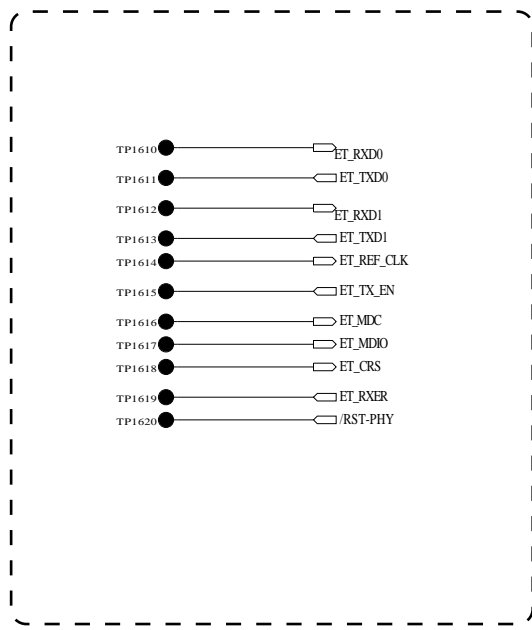
Rear AV



COMPONENT2

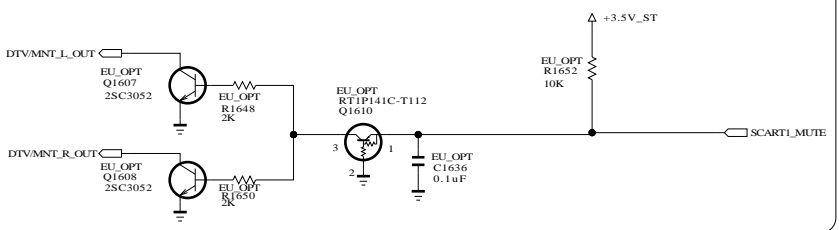


ETHERNET FOR DVB\_T2

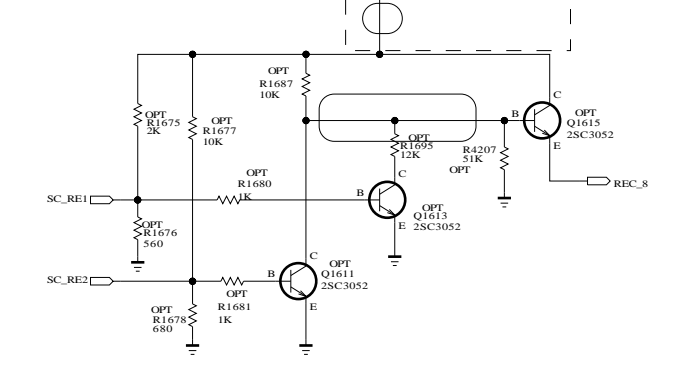


Full Scart/ Comp1

[SCART AUDIO MUTE]

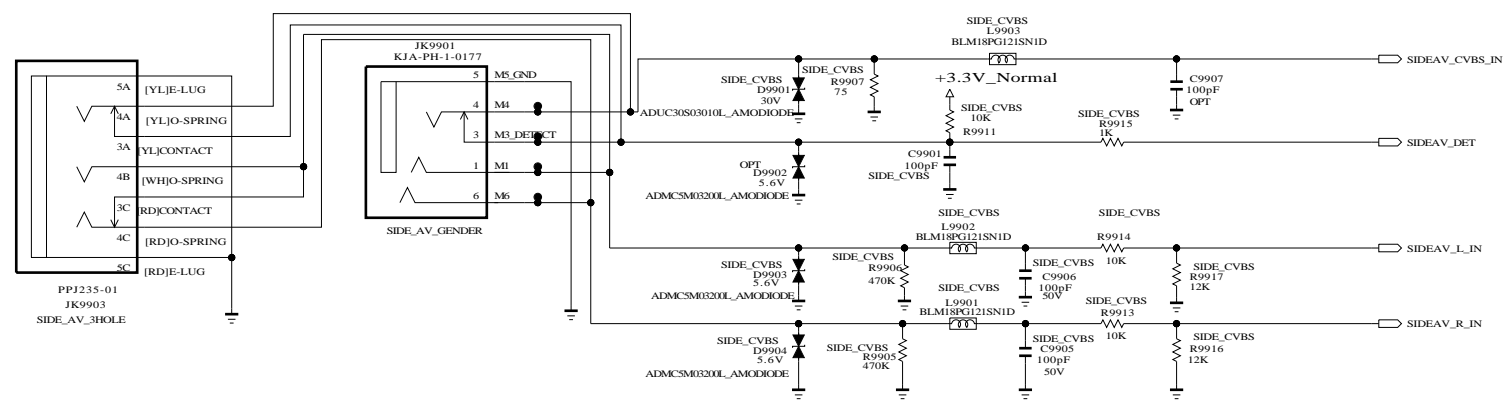


[SCART PIN 8]

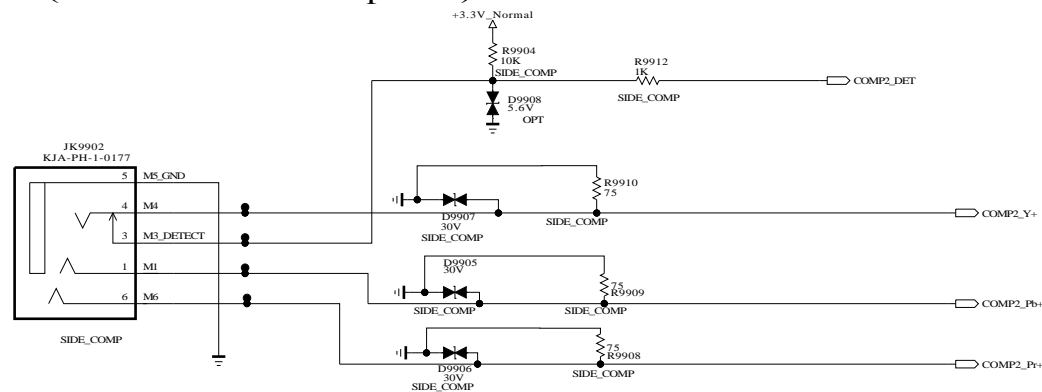


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILTRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SIDE CVBS PHONE JACK  
(New Item Development)

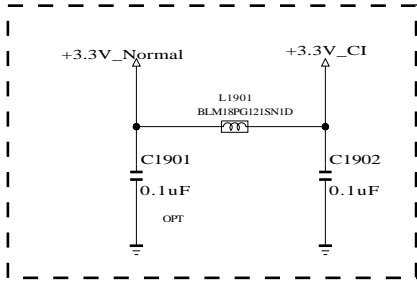
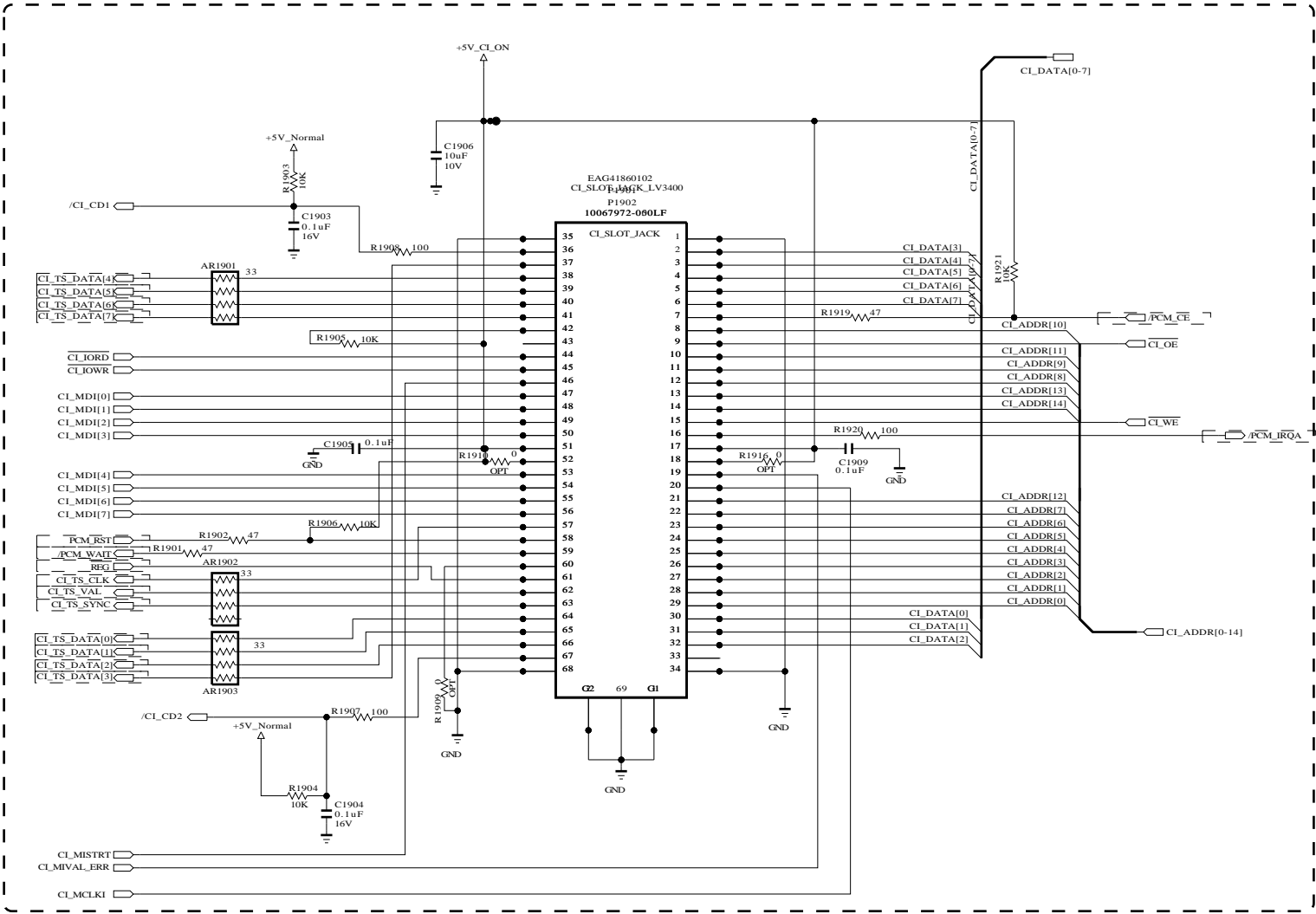


SIDE COMPONENT PHONE JACK  
(New Item Developmen)

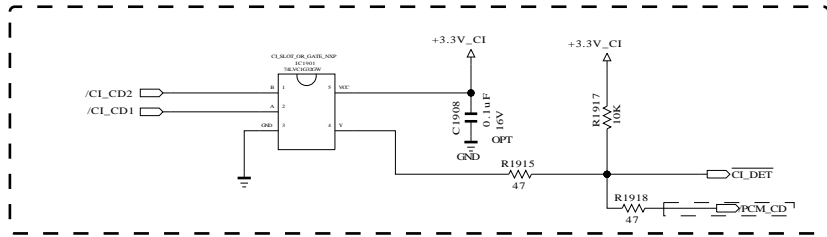


CI Region

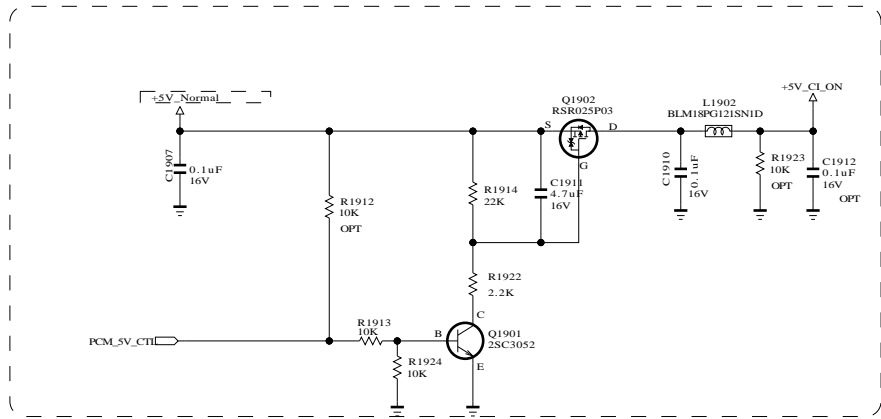
CI SLOT



CI DETECT

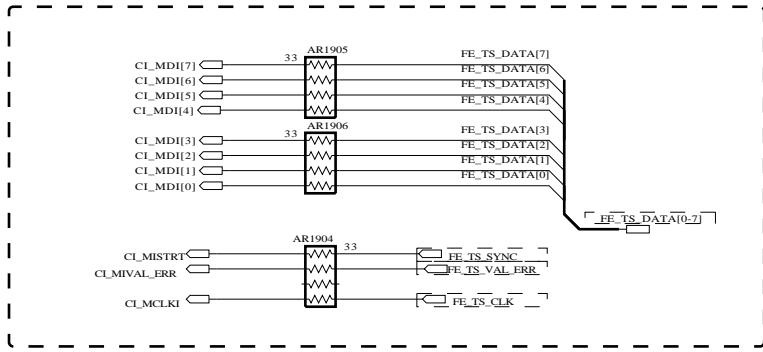


CI POWER ENABLE CONTROL

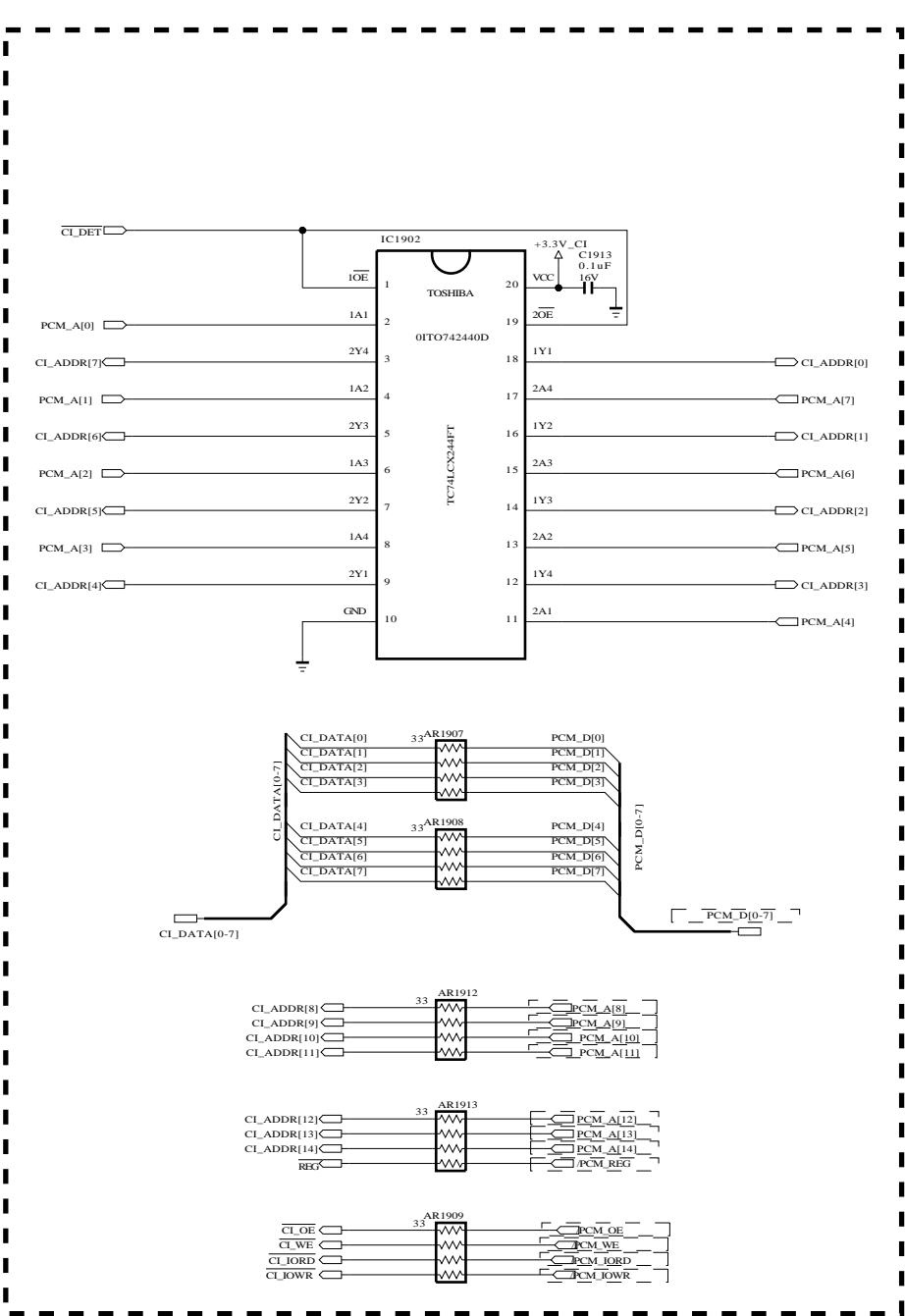


\* Option name of this page : CI\_SLOT  
(because of Hong Kong)

CI TS INPUT



CI HOST I/F



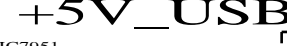
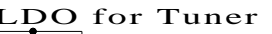
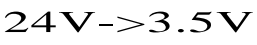
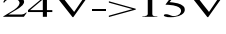
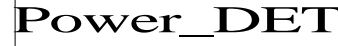
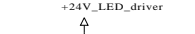
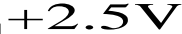
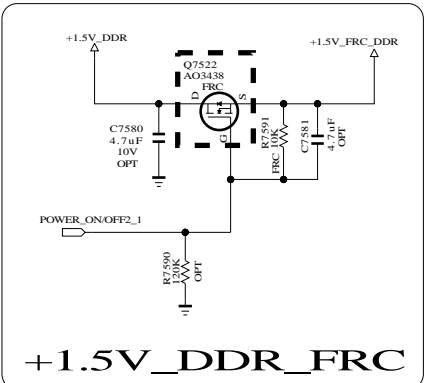
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILTRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

Figure 1 is a schematic diagram of a 16-channel 100-Gbit/s optical OFDM system. The system consists of a single input line from a 100-Gbit/s source that splits into 16 parallel channels. Each channel is represented by a box containing the input rate, the output rate, and the number of subcarriers. The channels are labeled as follows:

- Channel 1: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 2: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 3: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 4: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 5: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 6: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 7: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 8: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 9: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 10: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 11: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 12: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 13: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 14: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 15: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers
- Channel 16: 100-Gbit/s input, 100-Gbit/s output, 100 subcarriers

SECRET  
LGElectronics



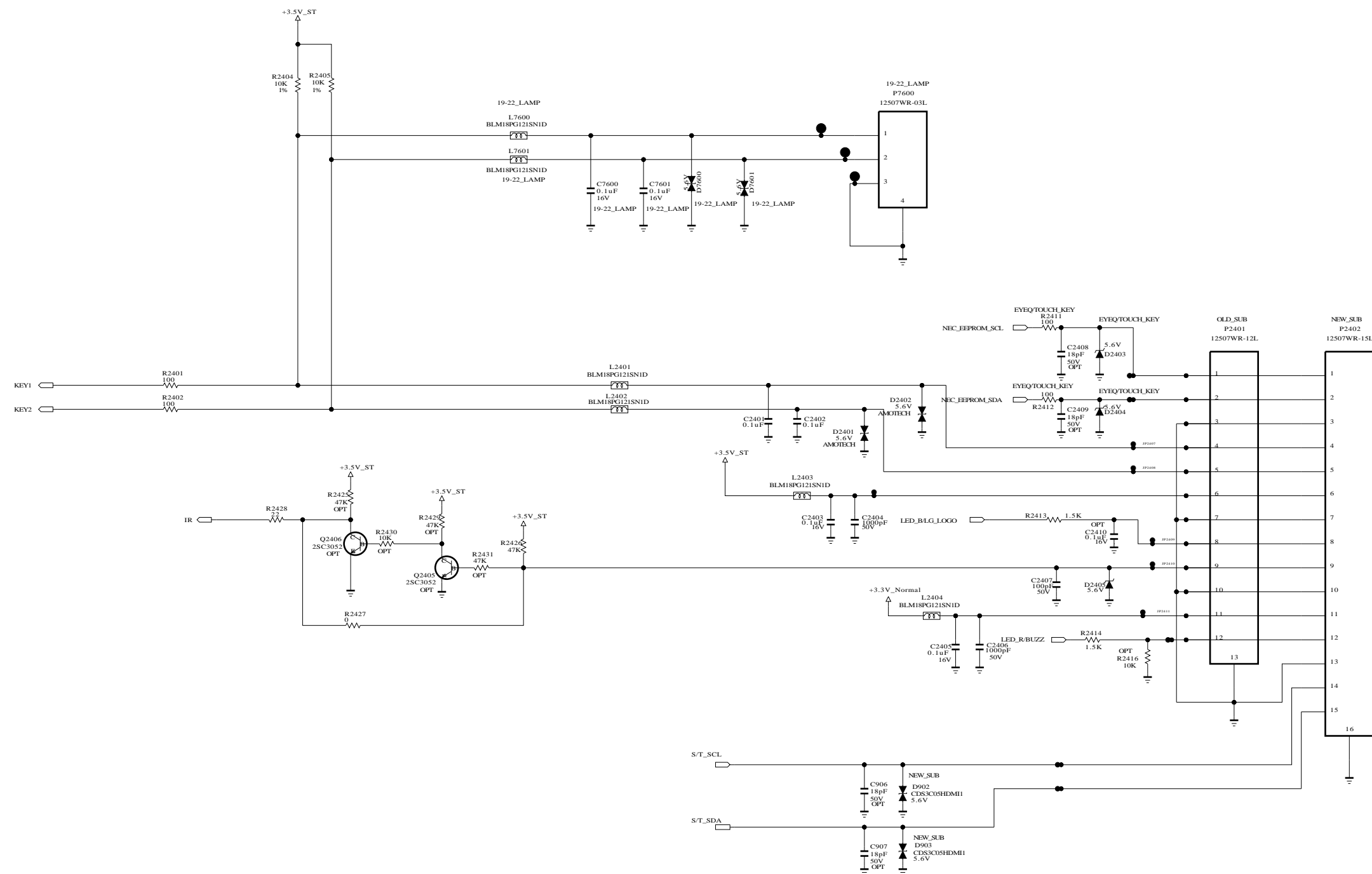




SECRET  
LGElectronics

|       |             |       |          |
|-------|-------------|-------|----------|
| MODEL | GP2R        | DATE  | 20101117 |
| BLOCK | POWER_SMALL | SHEET | 22 /     |



CONTROL  
IR & LED



THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



|                |       |      |          |
|----------------|-------|------|----------|
| MODEL          | GP2R  | DATE | 20101023 |
| BLOCK/CONT_SMA | SHEET | 23 / |          |

**P703**  
FI-RE51S-HF-J-R1500  
WAFAER\_FHD

**Panel\_Vcc**  
1.702  
100nm  
WAFAER\_FHD

**Capacitors:**  
C700: 10uF, 16V, OPT  
C709: 10000p, 50V, OPT  
C710: 0.1uF, 16V, WAFAER\_FHD

**Resistors:**  
R709: 10K, BIT\_SEL\_LOW  
R705: 3.3K, OPT  
R710: 10K, OPT

**Logic Components:**  
SCAN\_BLK2  
SCAN\_BLK1/OPC\_OUT  
PWM\_DIM  
2D/3D\_CTL

**Other Labels:**  
BIT\_SEL  
LVD5\_SEL  
+3.3V\_Normal

**Pin Connections:**  
1: Ground  
2: Ground  
3: Ground  
4: Ground  
5: Ground  
6: Ground  
7: Ground  
8: RXA4+  
9: RXA4+  
10: RXA3+  
11: RXA3+  
12: RXA4+  
13: RXA3+  
14: RXA3+  
15: RXA4+  
16: RXACK-  
17: RXACK+  
18: RXA2-  
19: RXA2+  
20: RXA1-  
21: RXA1+  
22: RXA0-  
23: RXA0+  
24: BIT\_SEL  
25: BIT\_SEL  
26: RXB4-  
27: RXB4+  
28: RXB4-  
29: RXB4+  
30: RXB3-  
31: RXB3+  
32: RXBCK-  
33: RXBCK+  
34: RXB2-  
35: RXB2+  
36: RXB1-  
37: RXB1+  
38: RXB0-  
39: RXB0+  
40: RXB0-  
41: SCAN\_BLK2  
42: SCAN\_BLK1/OPC\_OUT  
43: SCAN\_BLK1/OPC\_OUT  
44: PWM\_DIM  
45: PWM\_DIM  
46: 2D/3D\_CTL  
47: 2D/3D\_CTL  
48: 2D/3D\_CTL  
49: 2D/3D\_CTL  
50: 2D/3D\_CTL  
51: 2D/3D\_CTL  
52: Ground

TP726 ○ ————— □ RXD4-  
TP727 ○ ————— □ RXD4+  
TP728 ○ ————— □ RXD3-  
TP729 ○ ————— □ RXD3+  
  
TP730 ○ ————— □ RXDCK-  
TP731 ○ ————— □ RXDCK+  
  
TP732 ○ ————— □ RXD2-  
TP733 ○ ————— □ RXD2+  
TP734 ○ ————— □ RXD1-  
TP735 ○ ————— □ RXD1+  
TP736 ○ ————— □ RXD0-  
TP737 ○ ————— □ RXD0+  
  
TP738 ○ ————— □ RXC4-  
TP739 ○ ————— □ RXC4+  
TP740 ○ ————— □ RXC3-  
TP741 ○ ————— □ RXC3+  
  
TP742 ○ ————— □ RXCCK-  
TP743 ○ ————— □ RXCCK+  
  
TP744 ○ ————— □ RXC2-  
TP745 ○ ————— □ RXC2+  
TP746 ○ ————— □ RXC1-  
TP747 ○ ————— □ RXC1+  
TP748 ○ ————— □ RXC0-  
TP749 ○ ————— □ RXC0+

P7901  
FF10001-30  
HD\_60Hz\_NORMAL

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31

SMALL\_NC1  
SMALL\_NC2  
SMALL\_OPC\_OUT

TP721  
TP722  
PWM\_DIM  
OPC\_OUT

RXA3-  
RXA3+  
RXACK-  
RXACK+  
RXA2-  
RXA2+  
RXA1-  
RXA1+  
RXA0-  
RXA0+

+3.3V\_Normal  
R7919  
3.3K  
OPT  
R7920  
10K  
OPT

R7914 0  
HD\_60Hz\_NORMAL

PANEL\_VCC  
L7901  
150-ohm  
HD\_60Hz\_NORMAL

C7905  
10uF  
16V  
OPT  
C7904  
1000pF  
50V  
OPT  
C7903  
0.1uF  
16V  
OPT

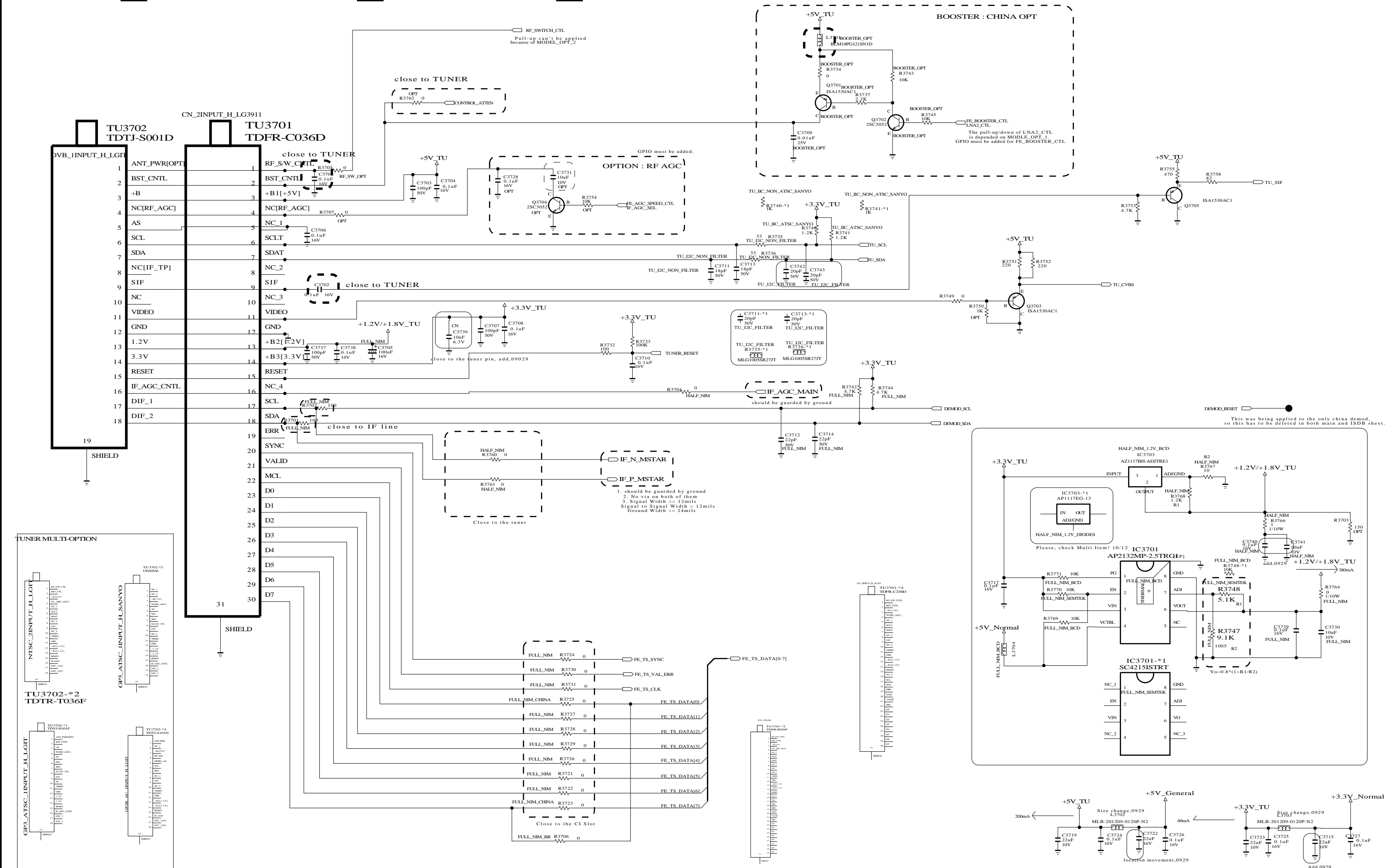
SMALL\_OPC\_EN  
SMALL\_NC3  
SMALL\_NC4

[illegible]

SECRET  
LGElectronics

|       |           |       |          |
|-------|-----------|-------|----------|
| MODEL | GP2R      | DATE  | 20101115 |
| BLOCK | VDS_SMALL | SHEET | 24 /     |

# GP2R\_GLOBAL\_TUNER\_BLOCK for Small Model



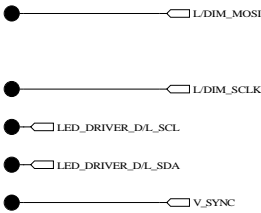
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics

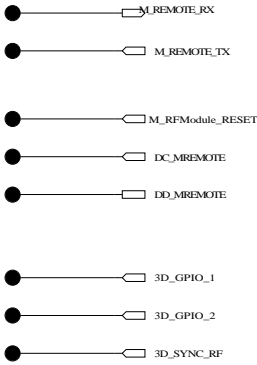




|       |             |       |          |
|-------|-------------|-------|----------|
| MODEL | GP2R        | DATE  | 20101023 |
| BLOCK | TUNER_SMALL | SHEET | 25 /     |

NON\_L/DIM\_LED/DRIVER



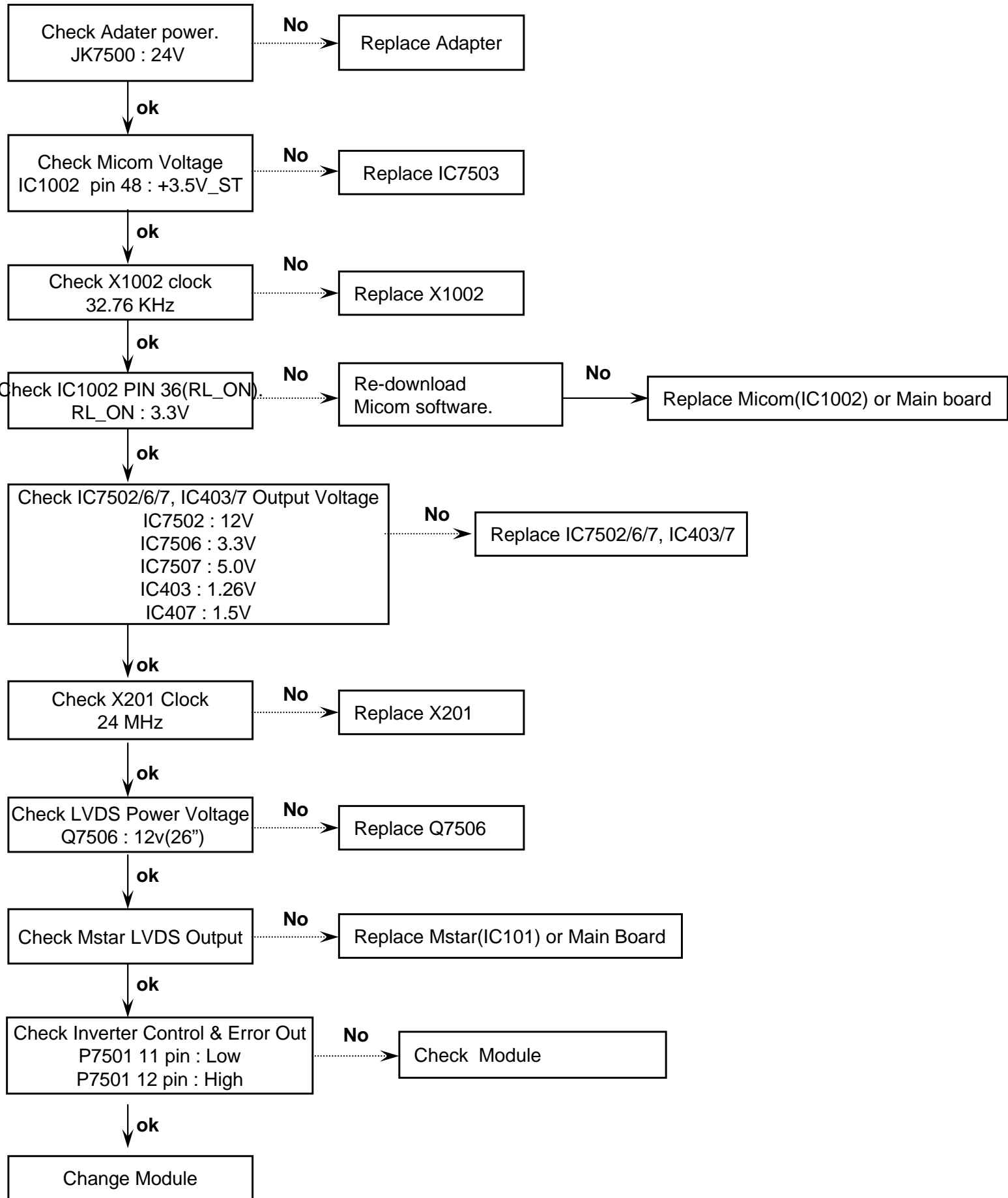
NON\_3D\_SG



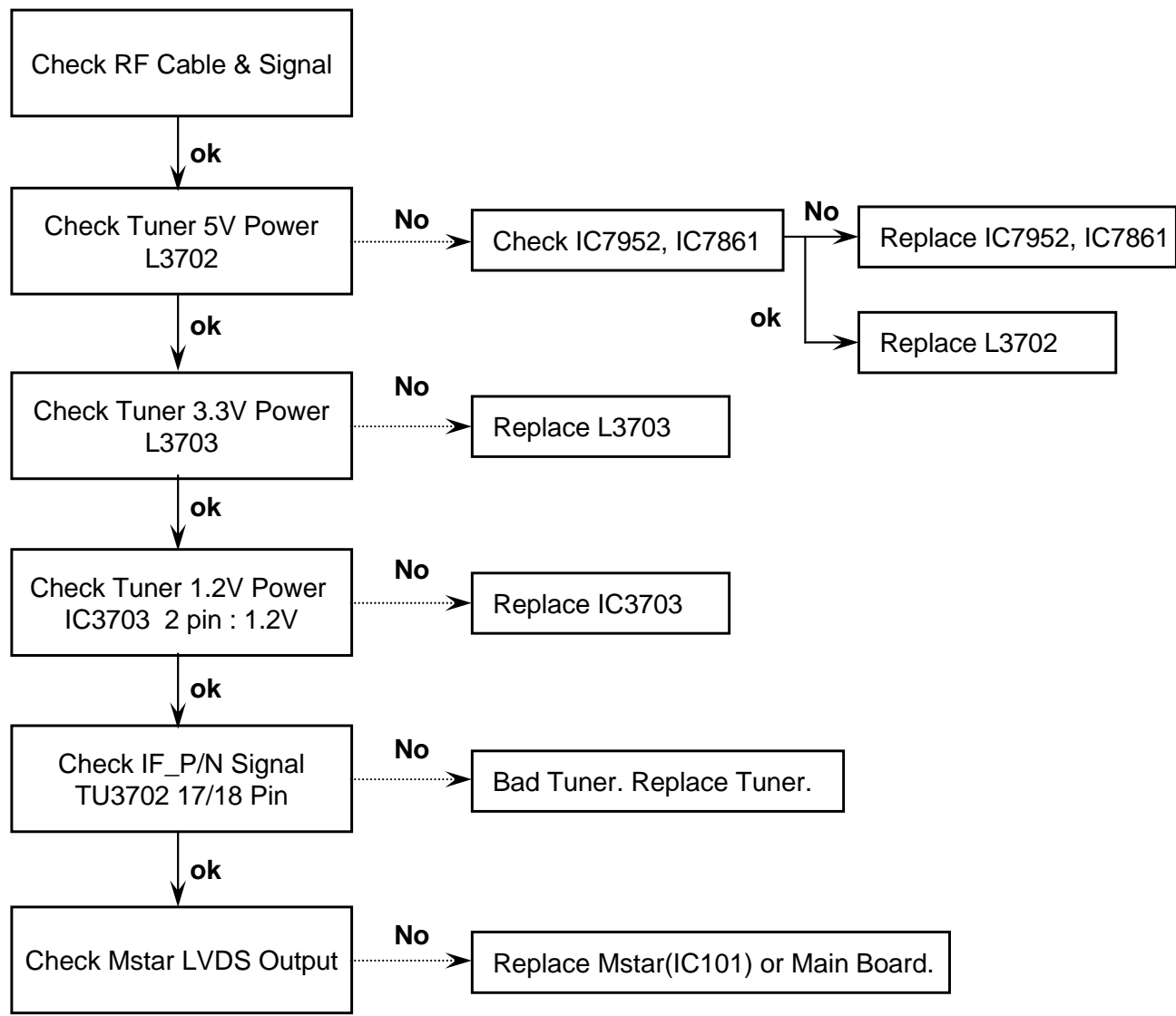
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



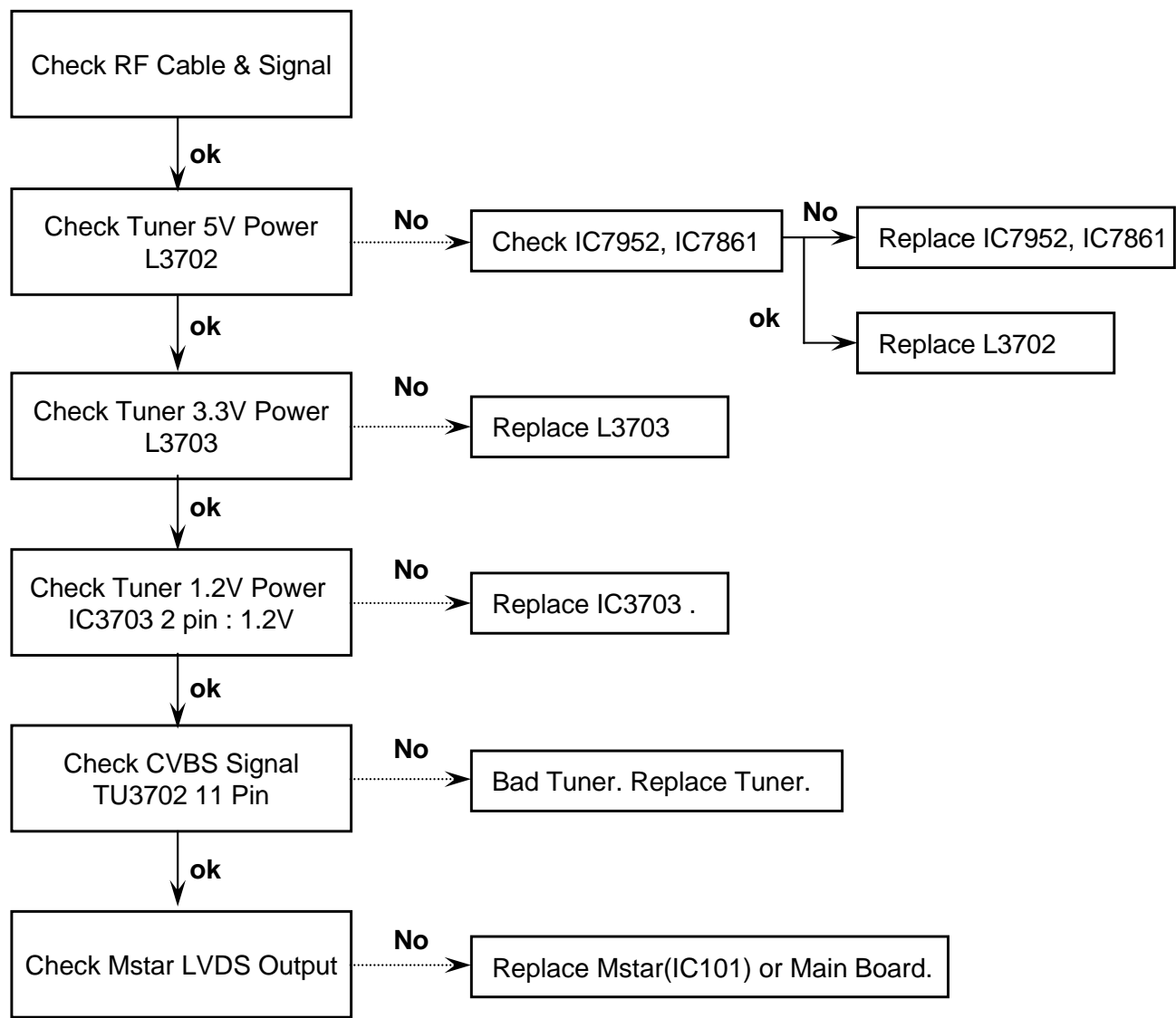
# 1. Power-up boot check



## 2. Digital TV Video

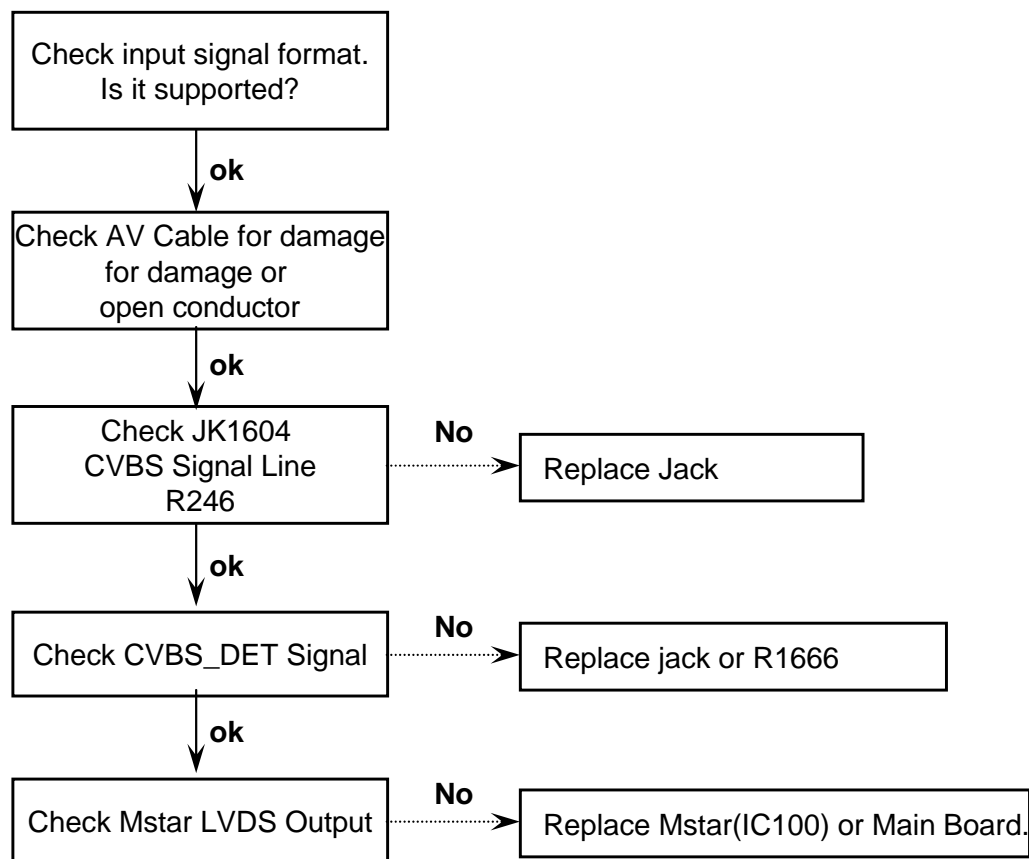


### 3. Analog TV Video

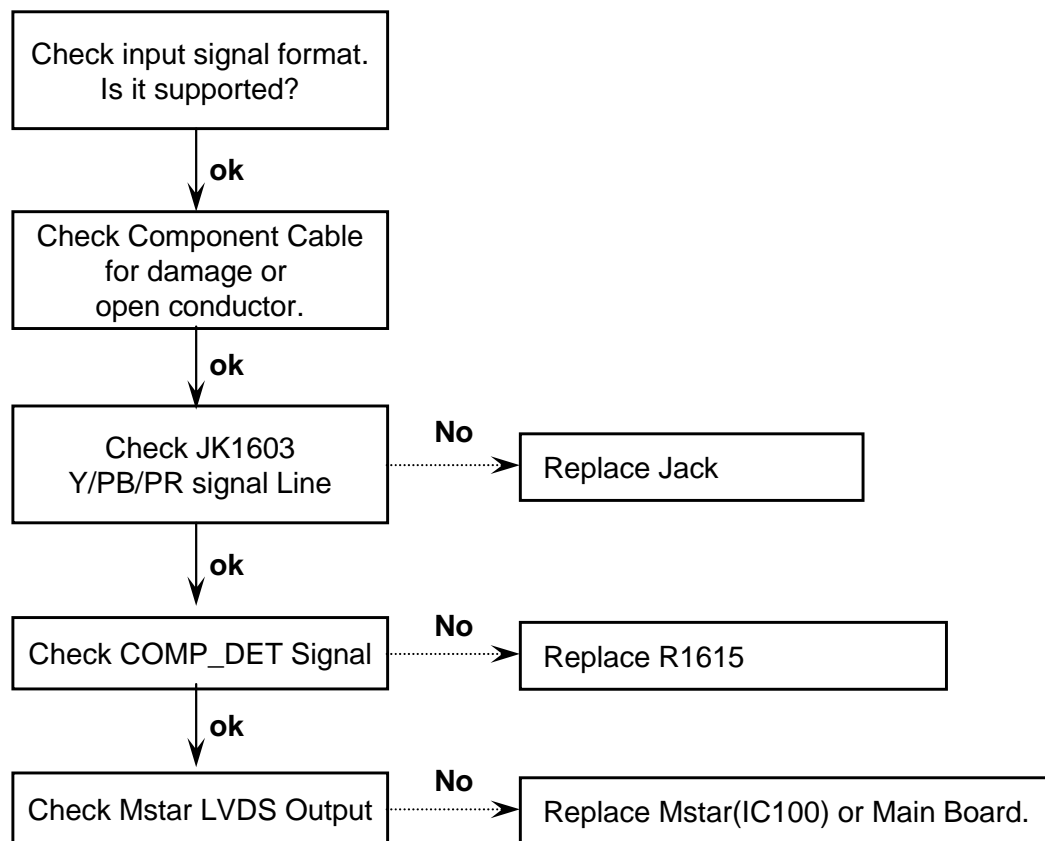




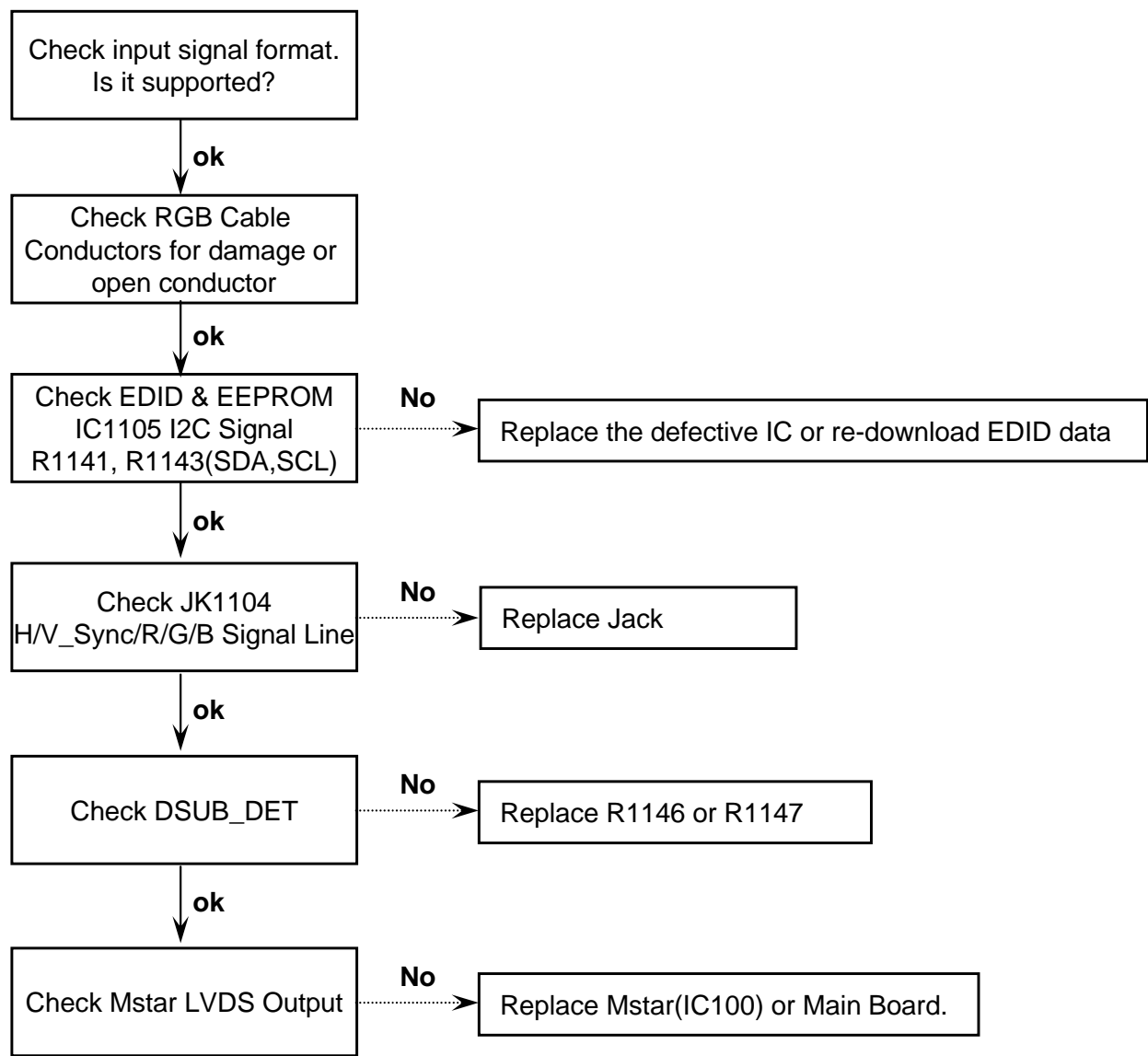
## 4. AV Video



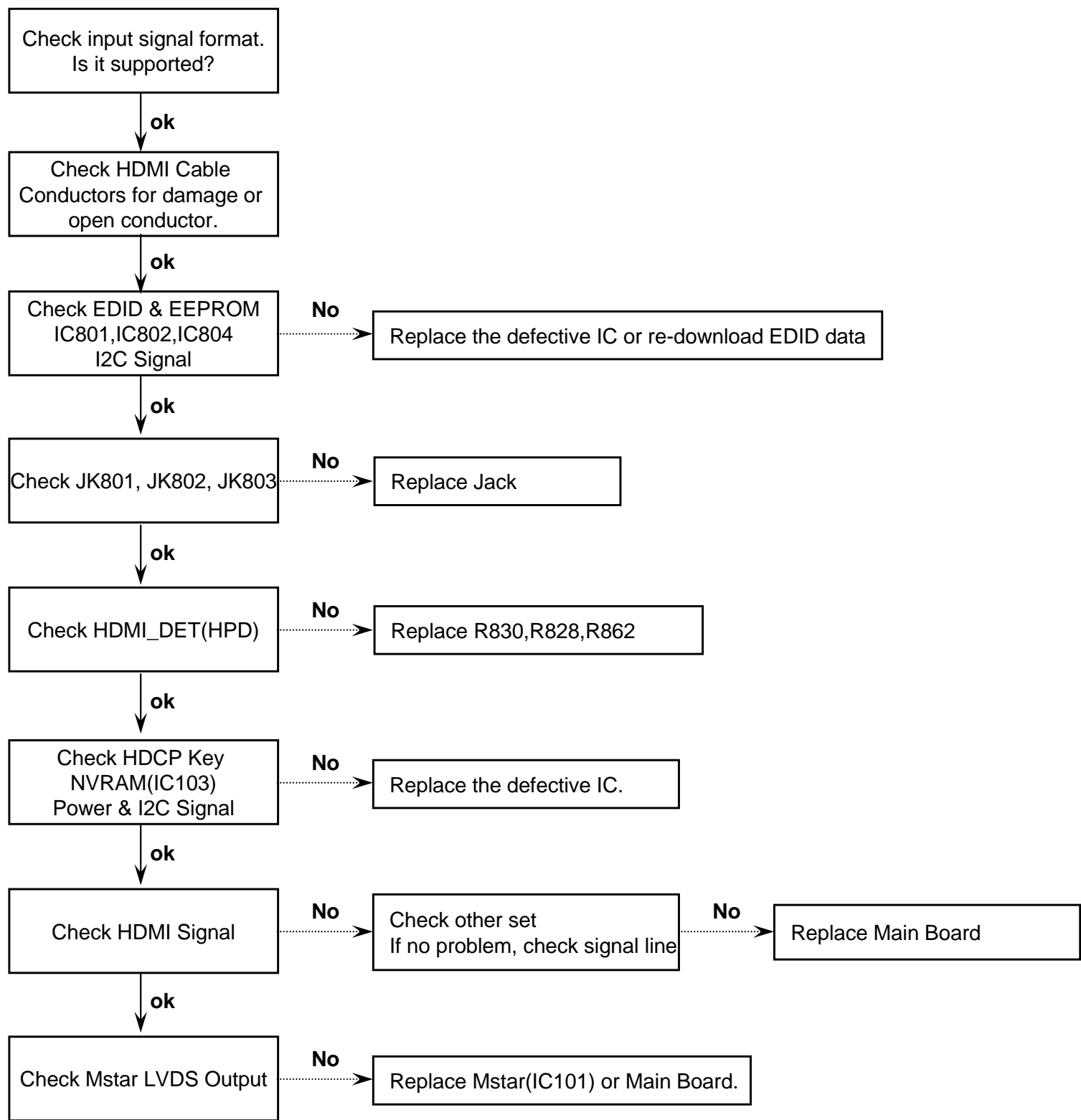
## 5. Component Video



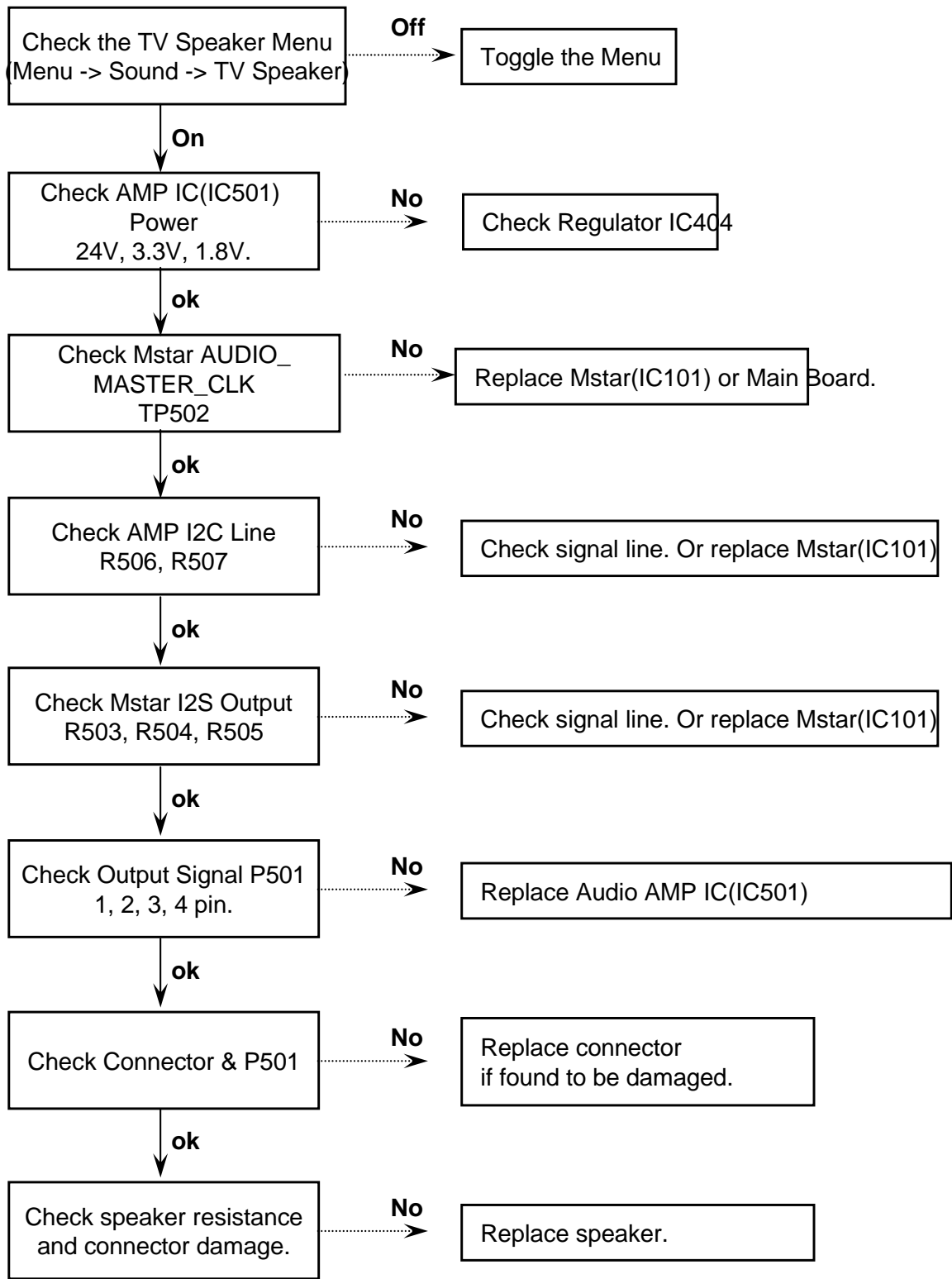
# 6. RGB Video



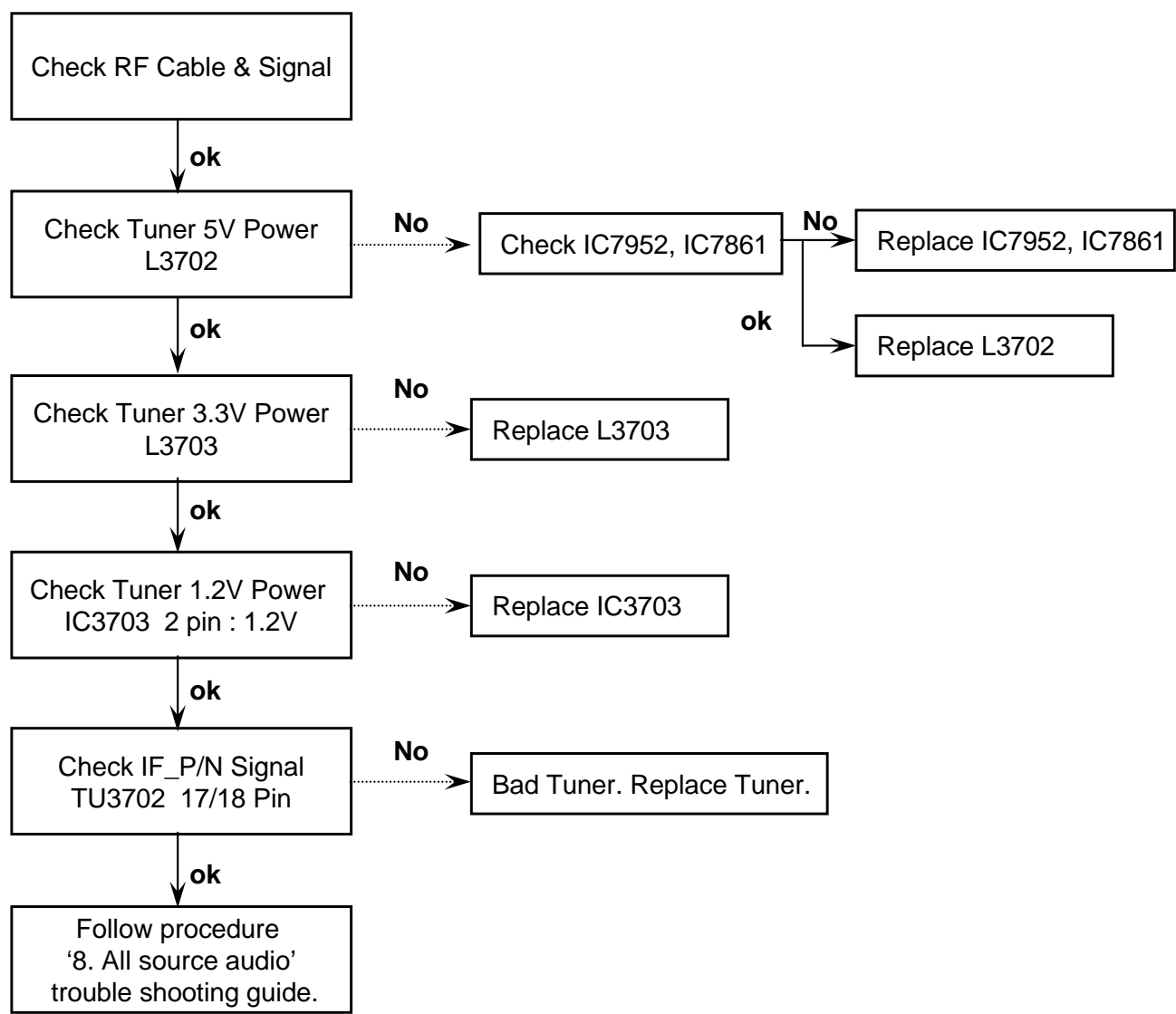
# 7. HDMI Video



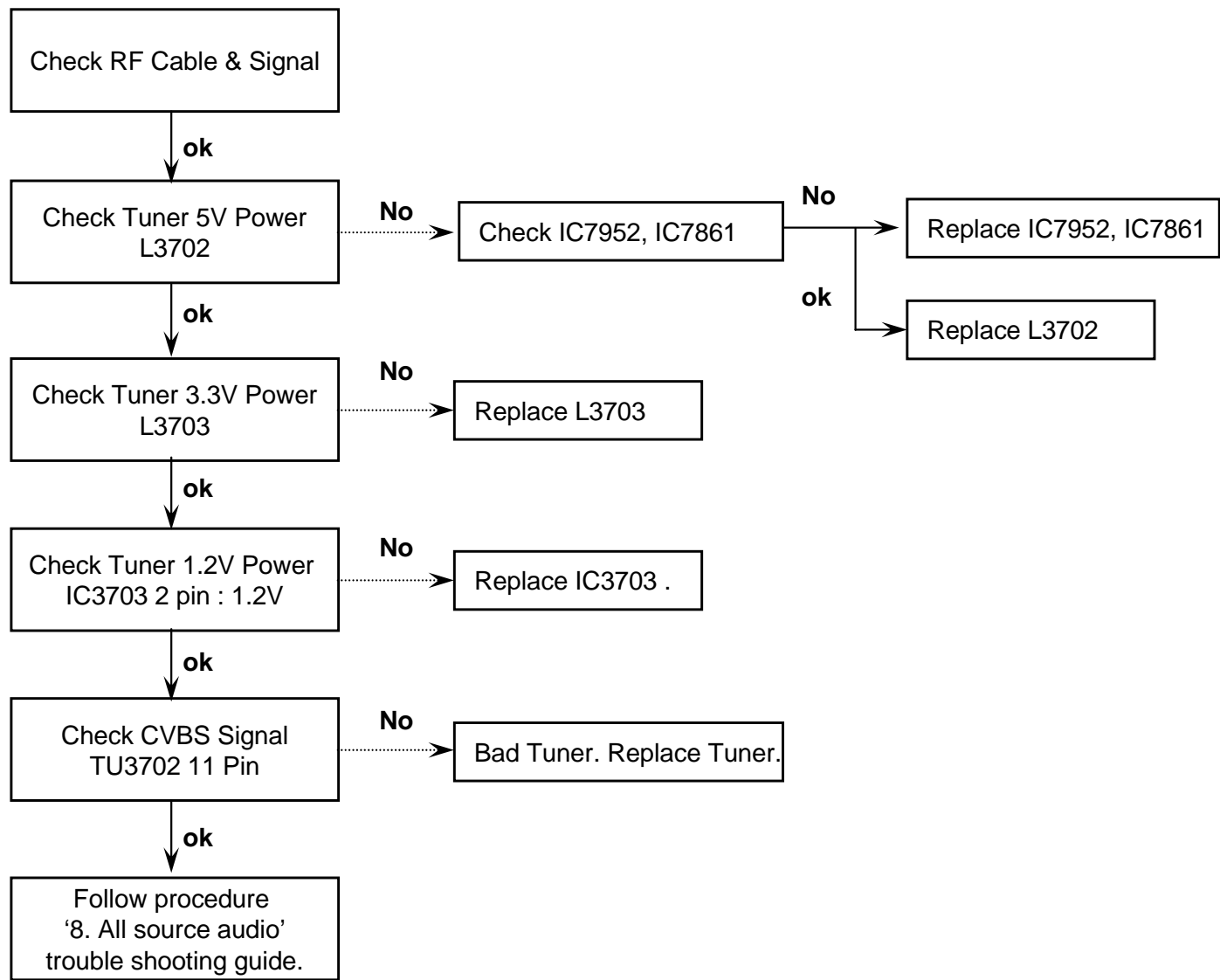
## 8. All Source Audio



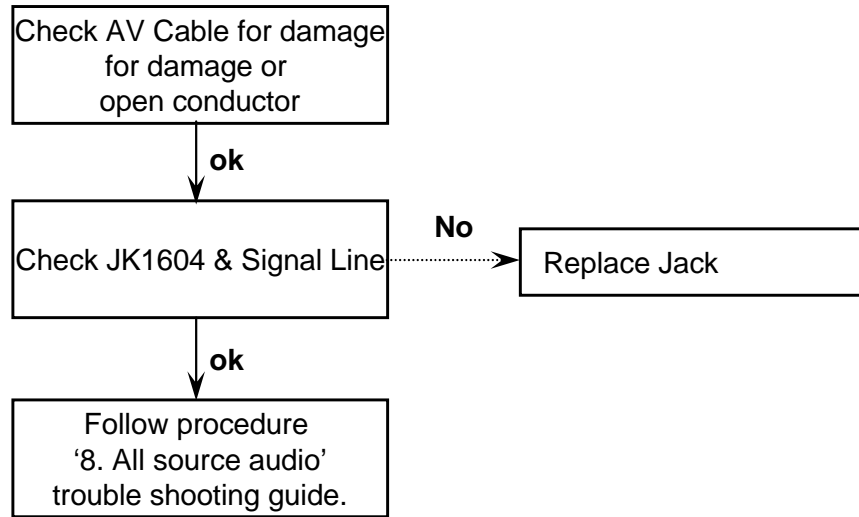
# 9. Digital TV Audio



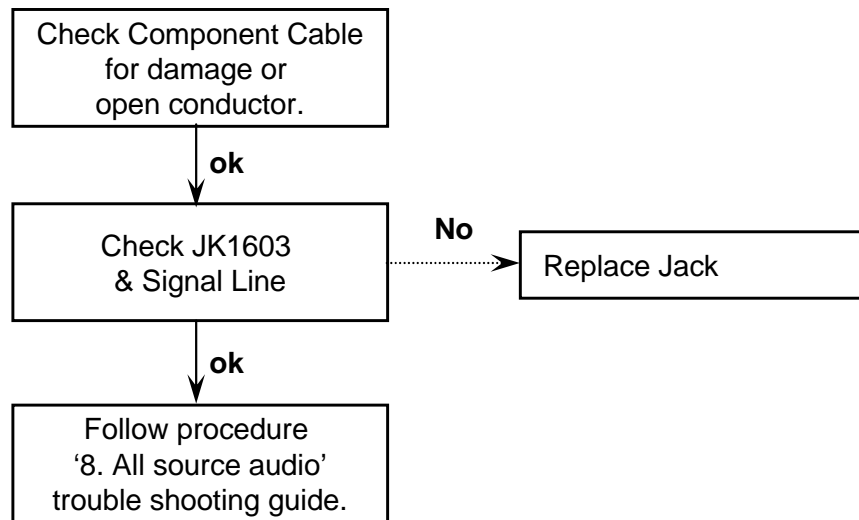
# 10. Analog TV Audio



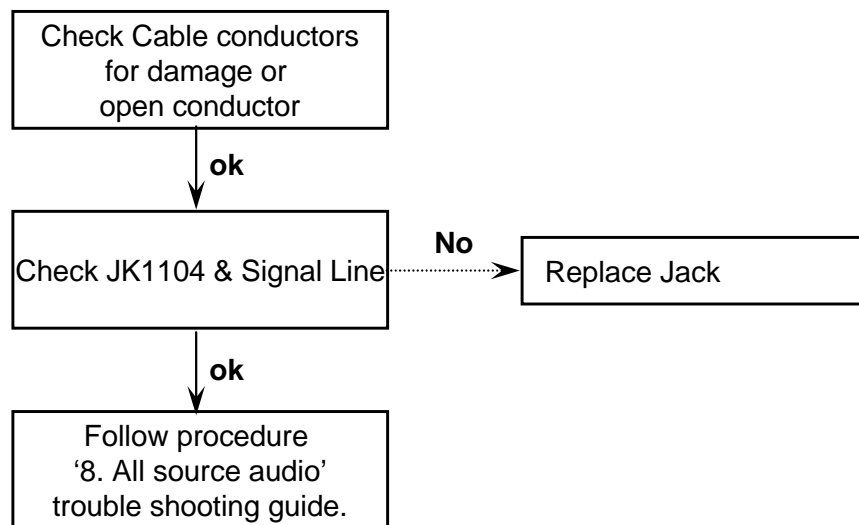
## 11. AV Audio

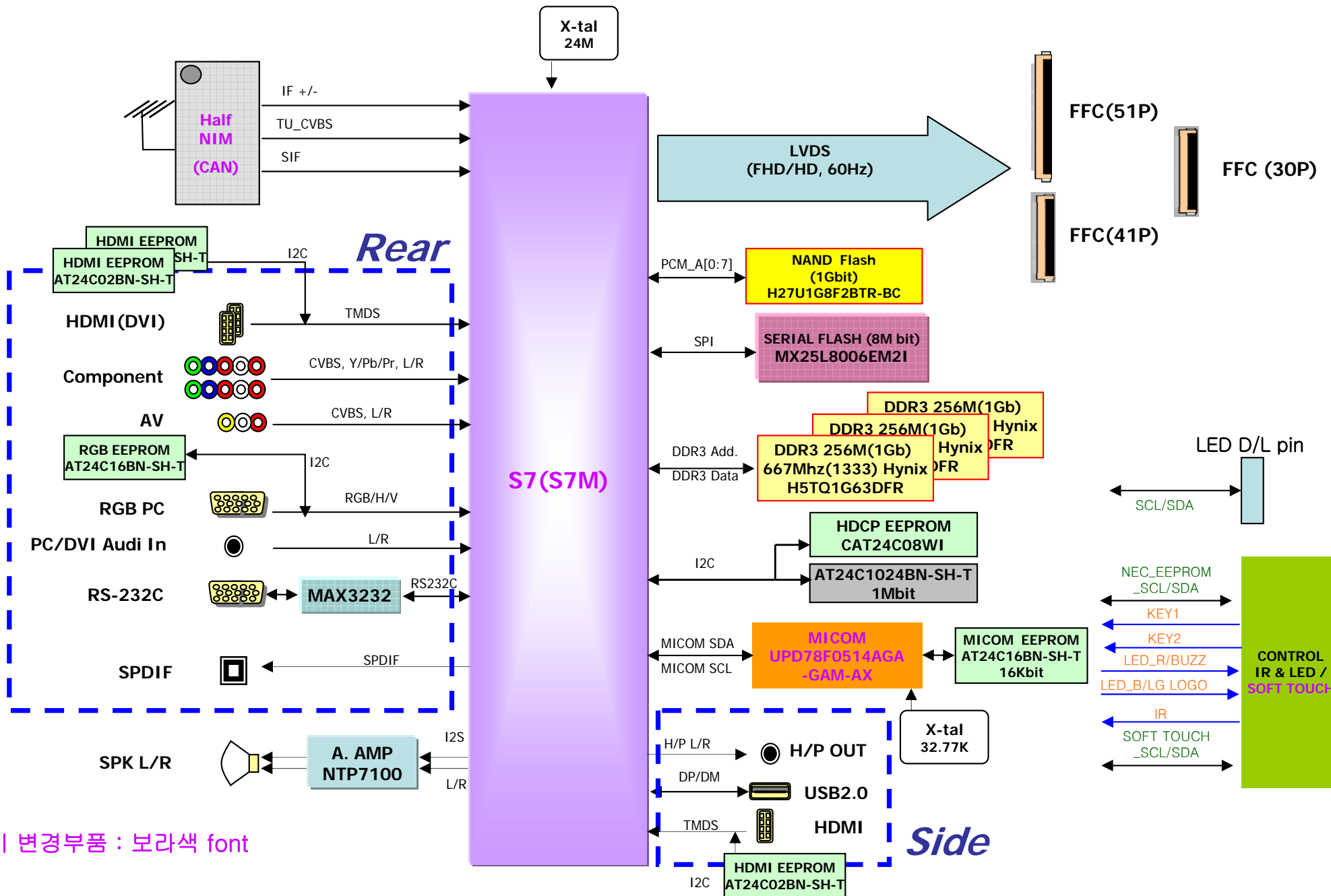


## 12. Component Audio



## 13. RGB Audio





※ GP2 대비 변경부품 : 보라색 font